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TWR-5672

STUDY OF SOLID ROCKET MOTOR FOR SPACE SHUTTLE BOOSTER

VOLUME II TECHNICAL

BOOK 3 OF 5

APPENDIX A

by

Thiokol / WASATCH DIVISION

A DIVISION OF THIOKOL CHEMICAL CORPORATION

prepared for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

George C. Marshall Space Flight Center

Contract NAS 8-28430
Data Procurement Document No. 314
Data Requirement MA-02

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FINAL REPORT

STUDY OF SOLID ROCKET MOTOR FOR SPACE SHUTTLE BOOSTER

VOLUME II TECHNICAL

BOOK 3 OF 5

APPENDIX A

by

THIOKOL/WASATCH DIVISION
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prepared for

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Marshall Space Flight Center, Alabama

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APPENDIX A

SYSTEM REQUIREMENTS ANALYSIS
SOLID ROCKET MOTOR STAGE
FOR THE SPACE SHUTTLE

CONTRACT:NAS8-28430
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PREPARED FOR

GEORGE C. MARSHALL SPACE FLIGHT CENTER
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARSHALL SPACE FLIGHT CENTER
HUNTSVILLE, ALABAMA 35812

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FOREWORD

SYSTEM REQUIREMENTS ANALYSIS

The system requirements analysis (SRA) contained herein was accomplished to the extent possible within the limited time available and scope of the study program, Contract No. NAS8-28430. The SRA includes data taken from the study program work statement Space Shuttle definition and inputs and documents provided TCC by the vehicle study contractors.

Where the methods and procedures of AFSCM 375-5 enabled the system engineering to be conducted with additional clarity, completeness, and/or expedience they were adopted. These forms and their format may be changed at a later date to agree with any NASA imposed system requirements analysis documentation and procedures. The system definition includes:

1. System analysis has been developed to define physical and functional requirements for the subsystems and systems. Many blank spaces exist in the analysis and as the data become available these can be completed. These blank spaces pinpoint areas for further trade studies and system definition.

2. Operations analysis has been performed to identify the requirements of the various launch operations, mission operations, ground operations, and logistic and flight support concepts. The analysis provides a basis for the estimated site manpower and GSE requirements.

The operational flow shown will later be substantiated and may be changed to reflect the results of trade-off studies to determine the most economical and logistically sound flow sequence. These studies cannot be conducted until definite decisions have been reached concerning the configuration of the SRM Stage hardware, fabrication locations for each item of hardware and costs of shipping from these locations.

Consideration has been made to alternate flows of components and assembly techniques. Only those flows appearing to be most practical with the information available have been perused in depth. Changes in philosophy, hardware, assembly sequence and location, etc., can be made with a minimum effort as decisions are made. Operational GSE definition, facilities requirements and technical manual requirements have also evolved from the analysis. Recovery technique and requirements are identified and form the basis for the GSE, facilities and manpower required for recovery.

3. Maintenance engineering analysis will be added to the SRA data as this analysis evolves. From these data will come the maintenance concepts associated with each reparable item, spares provisioning requirements, maintenance manuals, personnel requirements, facility requirements, training equipment requirements, and special tools and equipment required for maintenance. Forms and data will be in accordance with NASA imposed requirements.

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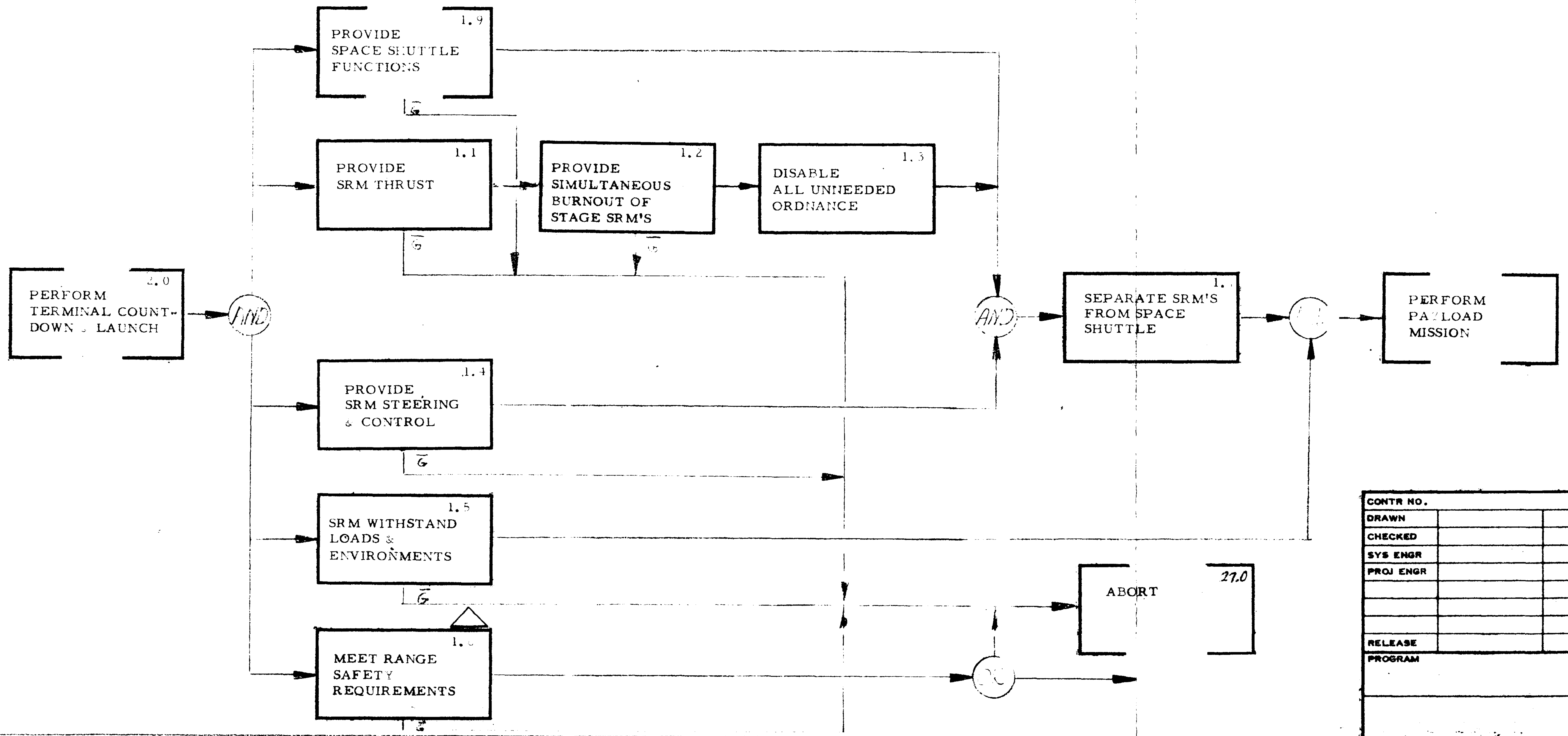

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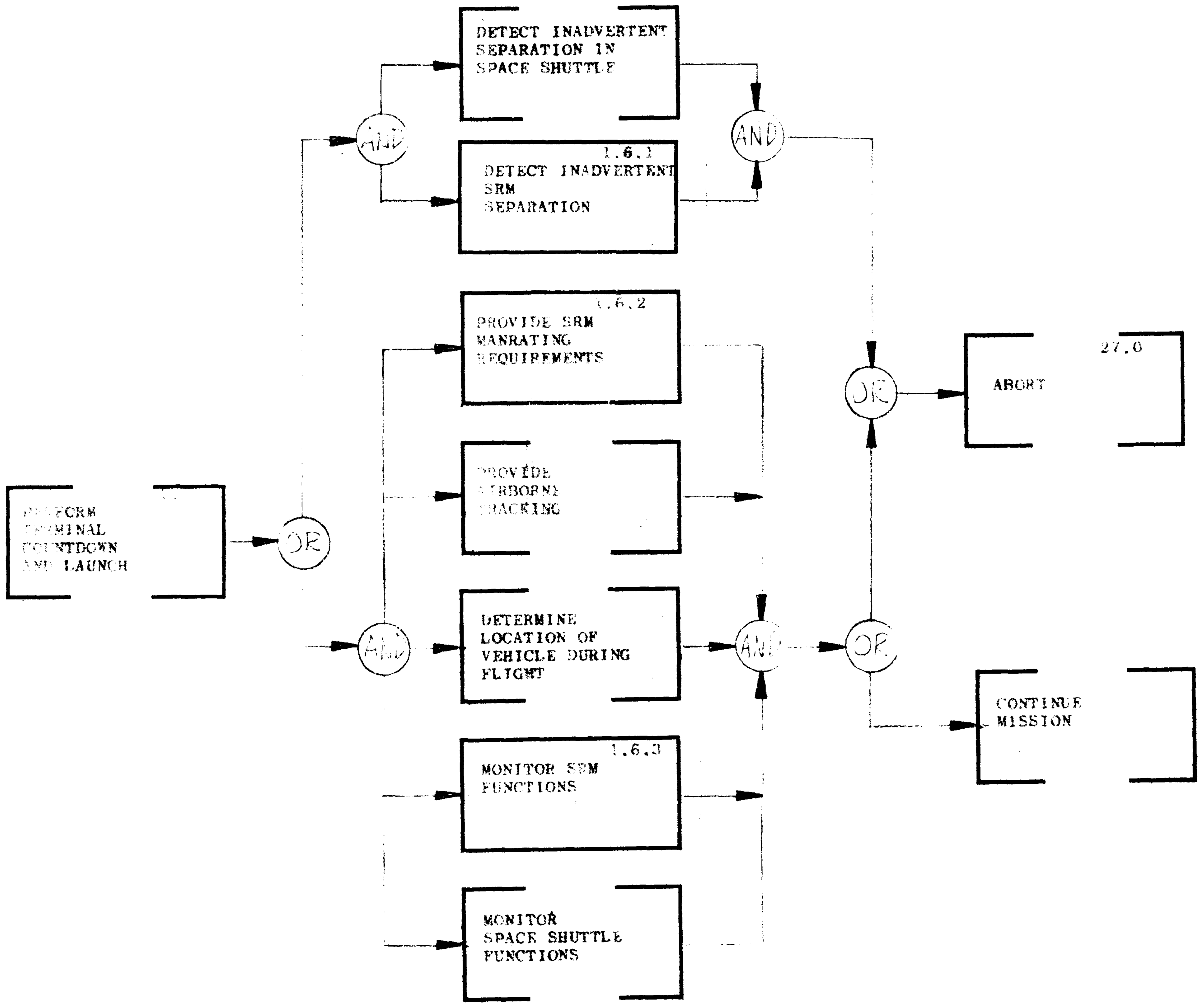

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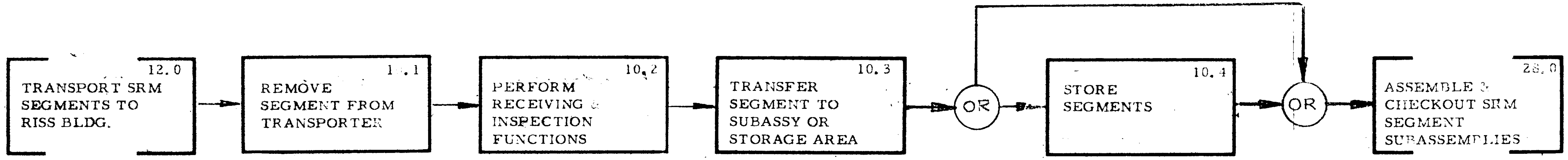

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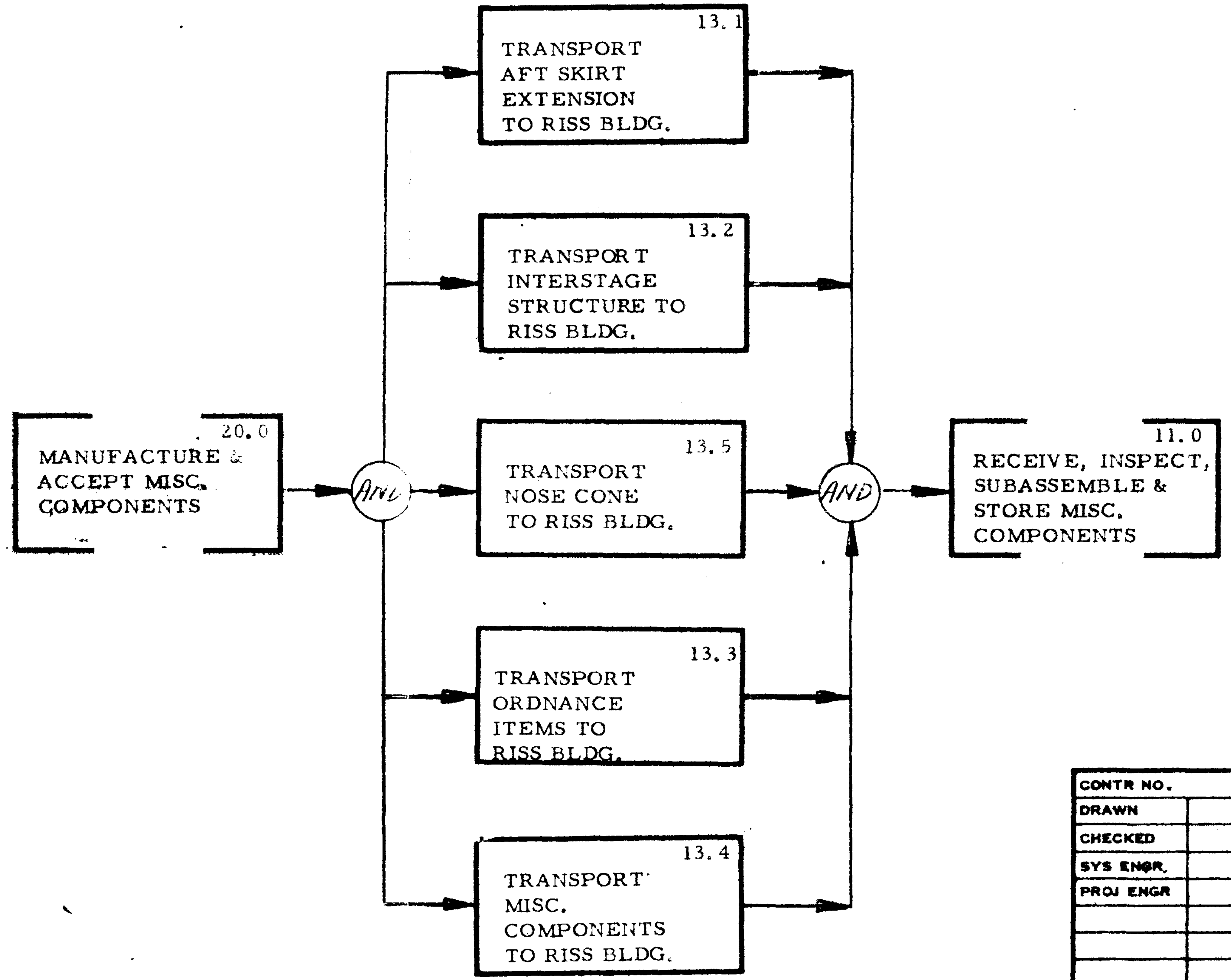

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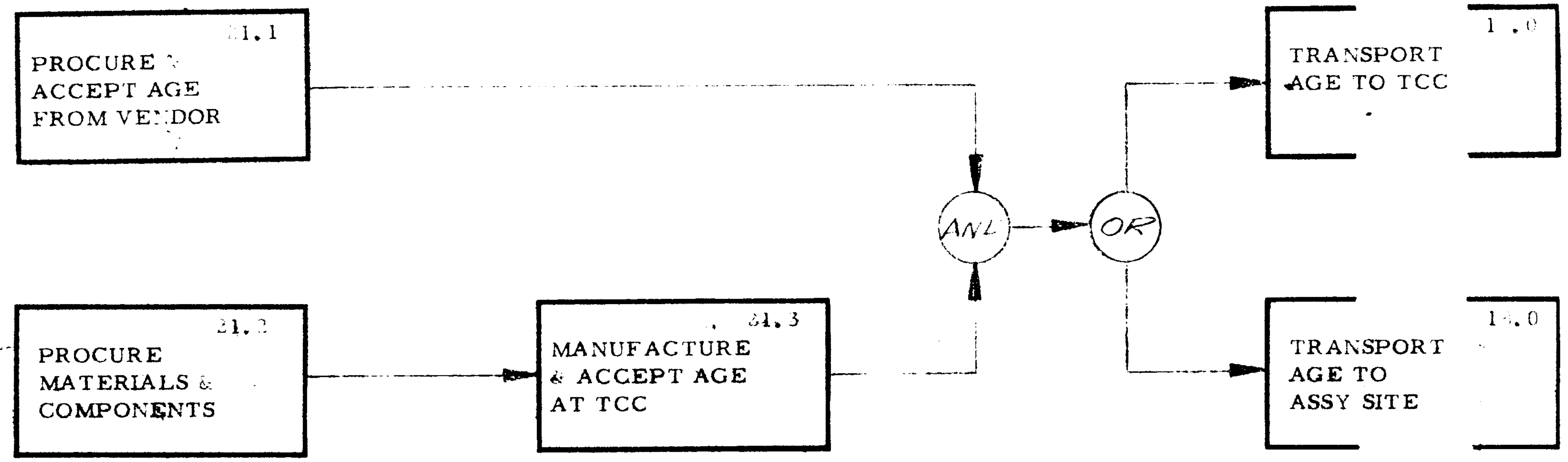

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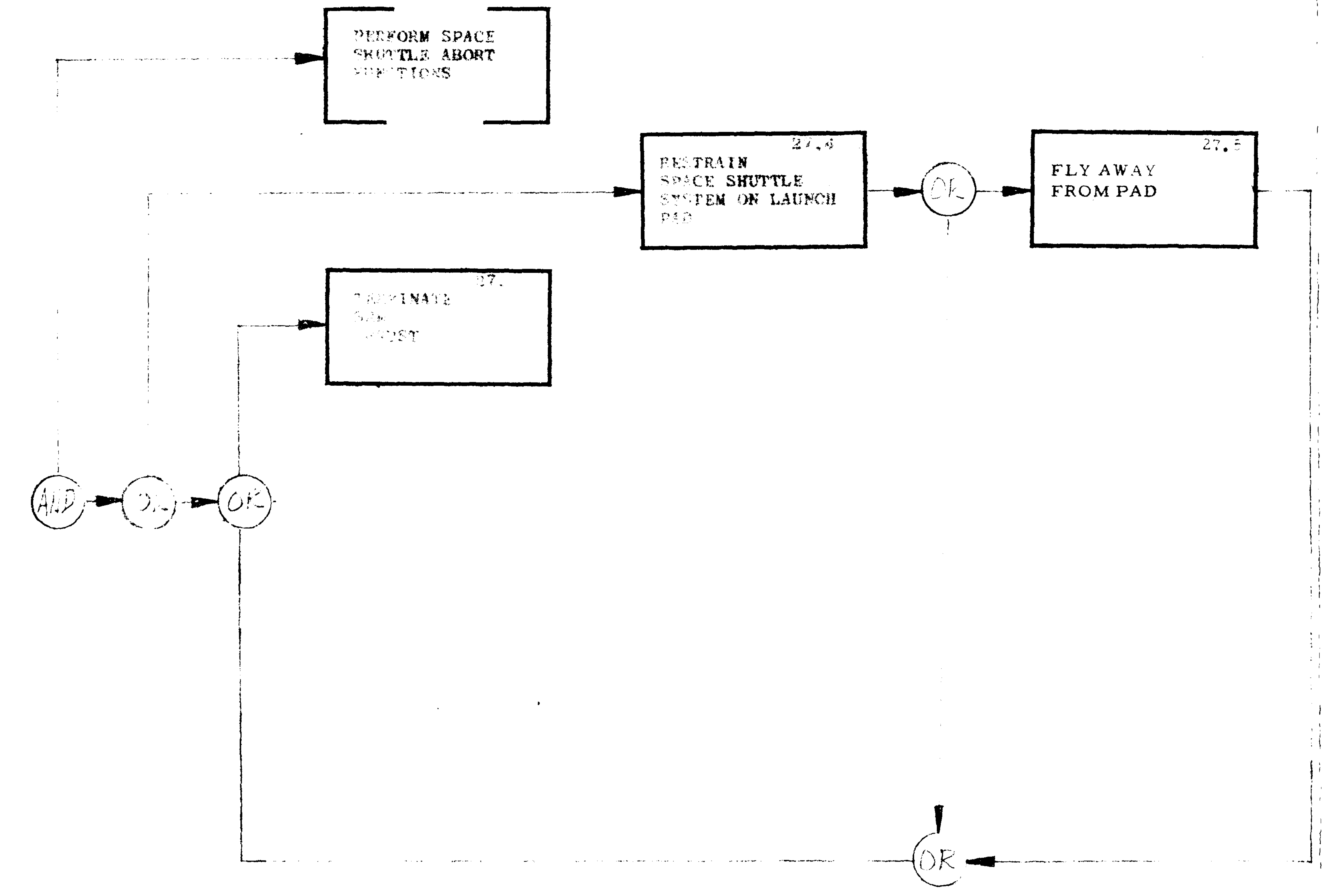

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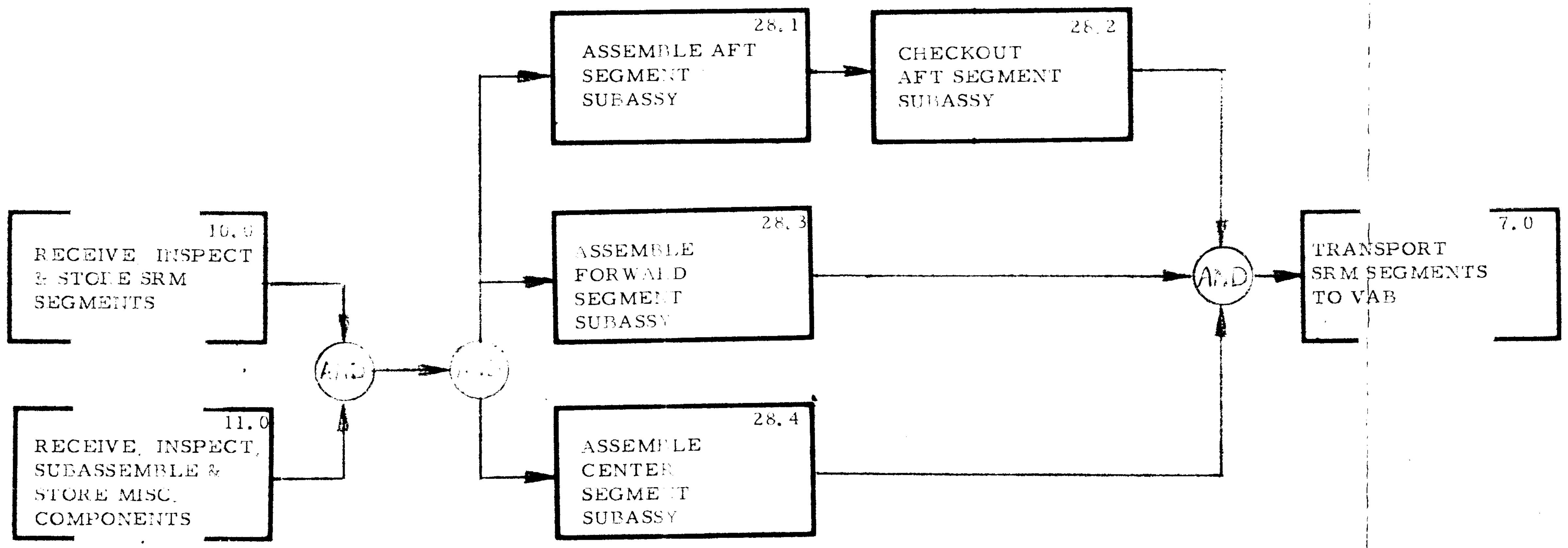

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WASATCH DIVISION BRIGHAM CITY, UTAH

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ASSEMBLE AND CHECKOUT SRM SEGMENT SUBASSEMBLIES

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REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
1.0 Perform Flight Mission	A. <u>Definition</u> The definition of the flight mission, so far as the SRM Stage is concerned, is as follows: Start of mission occurs upon separation of the ground umbilical from the Space Shuttle System and ends with SRM Stage splasdown. B. <u>Flight Characteristics</u> Consideration shall be made of the SRM Stages capability to provide stability and control and withstand the flight environments, loads and flight performance characteristics through and flight duration defined above. C. <u>Electrical System</u> The electrical system wiring and cabling installation shall achieve, as nearly as practical, point-to-point wiring system with a minimum number of electrical connectors and connections. Electrical wiring shall be identified and marked in accordance with The electrical system for the SRM Stage shall provide for performance of the following functions when the applicable systems form a part of the SRM Stage:								

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1.0 Perform Flight Mission	1. Condition steering commands received from the orbiter and apply commands to the TVC system. 2. Supply and distribute airborne electrical power, with the exception that the orbiter will supply staging - motor squib power, command - destruct squib power, igniter squib power, TT squib power and steering command signals. 3. Distribute ground power supplied from ground equipment. 4. Distribute and control signals from the orbiter to the destruct ordnance, TT ordnance, staging rocket ignition ordnance and steering command signals. 5. Provide for enabling and disabling of the inadvertent separation destruct system 6. Provide airborne instrumentation conditioned to the proper voltage level at the SRM/Space Shuttle electrical interface. 7. Distribute and isolate the redundant ignition current and provide current - limiting for all ordnance circuits. 8. Provide switching capability for power transfer from ground to airborne power.								

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1.0 Perform Flight Mission	9. Provide and distribute regulated instrumentation excitation power. 10. Provide stray voltage detection for the destruct and igniter ordnance. 11. Provide recovery system deployment power. D. Instrumentation The SRM Stage instrumentation shall provide instrumentation signal outputs to verify and evaluate events and conditions prior to and during flight in accordance with the applicable CEI design specification. 1. Flight Instrumentation The SRM Stage flight instrumentation system shall provide 12 channels of data conditioned to a 0 to 40 mullivolt direct current output to the Space Shuttle. No flight instrumentation failure shall cause a failure of the flight vehicle.									

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1.0 Perform Flight Mission	2. Accuracy The instrumentation system shall have an end-to-end demonstrated accuracy of (3-sigma). The output impedance shall be 5,000 ohms maximum or 1,000 ohms maximum shunted by 0.1 microfarad capacitance. E. Reliability The SRM Stage shall meet the quantitative requirements TBD. F. Environment The SRM Stage shall suffer no degradation of performance during and after exposure to the following environments: 1. Acoustic Noise The SRM Stage shall be exposed to maximum acoustic excitation at liftoff, in the transonic region and the region of maximum dynamic pressure. The sound field will be random over a broad spectrum. provides the maximum expected acoustic noise environment external to the vehicle surface.								

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1.0 Perform Flight Mission	Component acoustic levels will be a function of these exterior levels and the characteristics of the structure and the compartment cavity. 2. Vibration The SRM Stage will be exposed to complex vibrations due to the SRM burning, launch noise energy, aerodynamic boundary layer noise energy, etc. Maximum SRM vibrations will occur either during liftoff, through transonic region, or during maximum dynamic pressure. provides the maximum expected random vibration environment for various vehicle compartments and component installation. 3. Shocks The SRM Stage will be exposed to shocks resulting from SRM ignition, SRM burnout/tailoff, Space Shuttle ignition, SRM - Space Shuttle separation and gusts. provides the shock environments expected for various vehicle compartments. See Table and Figure for the shock requirement definition.								

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1.0 Perform Flight Mission	4. Acceleration The SRM Stage maximum forward acceleration shall be 3.0 g's, and the maximum lateral sustained acceleration shall be ______ with superimposed vibration. 5. Altitude The vehicle shall be capable of launch at sea level to 2,500 feet and capable of captive operation from sea level to 6,000 feet. 6. Temperature The vehicle shall be designed to withstand the temperature conditions imposed during the SRM flight phase. ______ specifies the requirements for this environment. 7. Overpressure The vehicle shall be capable of withstanding a peak overpressure of ______ psi with the payload in place and with all propellant tanks empty or fueled and pressurized or unpressurized.								

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1.0 Perform Flight Mission	8. <u>Electromagnetic Interference</u> The vehicle shall meet the EMI requirements of TBD. Vehicle hardware shall have been qualified to the EMI test requirements of TDB. 9. <u>Weight and Center of Gravity</u> The weight and center of gravity of the SRM hardware items shall conform to the requirements of ____________. G. <u>Safety</u> 1. Safety shall not be sacrificed for weight improvements. 2. The design of the vehicle structure shall reflect the factors of safety specified in Function 1.6.2.								

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1.1 Provide SRM Thrust	"Provide SRM Thrust" begins immediately following the ignition of the SRM's and ends upon sensing thrust decay to TBD pounds force or less required for separation. A. Functional Characteristics The SRM's shall conform to the following limiting functional characteristics from sea level to 200,000 feet for propellant mean bulk temperatures of 40 degrees to 90 degrees F. All performance characteristics are specified relative to the nozzle centerline. 1. Ignition Transient The SRM ignition delay times shall be TBD to TBD milliseconds for propellant conditioning temperatures of 40 degrees to 90 degrees F, inclusive. The motor pressure transient at ignition from 50 to 100 percent of maximum chamber pressure shall be such that the differential chamber pressure between any two motors simultaneously ignited shall not exceed TBD percent of the maximum chamber pressure.		SRM						

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1.1 Provide SRM Thrust	Figures TBD through TBD, inclusive, present plots of head end chamber pressure versus time and thrust versus time for 0.5 second after application of "Fire Signal" for motor mean bulk temperatures of 40 degrees, 60 degrees, 80 degrees and 90 degrees F, including the 3 - sigma variance for each. 2. Vacuum Performance The SRM's nominal performance at vacuum conditions along the nozzle centerline and at a conditioned temperature of 70 degrees F shall be as listed in Table JB-3, herein, and consistent with motor specification graphs in Figure TBD. Figures TBD through TBD inclusive, and Table TBD present, respectively, plots and tabulations of SRM's at vacuum conditions.								

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1.1 Provide SRM Thrust	Thrust versus time, head end pressure versus time, aft end pressure versus time, will be plotted as families of curves for motor mean bulk temperatures of 40 degrees, 60 degrees, 80 degrees and 90 degrees F, including the 3 - sigma variations for each. 3. Sea Level Performance The SRM's performance at sea level conditions is presented in Table TBD, for motor mean bulk temperatures of 40 degrees, 60 degrees, 80 degrees and 90 degrees F, including nominal values at each temperature and 3 - sigma variance for each. Data will include web action time, action time, total impulse, action time total impulse, delivered specific impulse initial thrust and ignition delay. 4. Maximum Expected Operating Pressure Chamber Pressure: The maximum expected operating chamber pressure (MEOP) is 1000 psi.								

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1.1 Provide SRM Thrust (Continued)	5. Thrust Differential The maximum thrust differential between any two motors with a 3 degree F temperature difference, shall not exceed TBD pounds during tailoff. 6. Nozzle Expansion Ratio The nozzle expansion ratio at ignition shall be 10:1 B. SRM's must be capable of satisfying the following performance requirements during burnout (i.e., tailoff). 1. Tailoff Characteristics a. The maximum thrust differential between any two motors with a F mean bulk temperature difference shall not exceed TBD pounds during tailoff. b. The nominal tailoff requirements for individual SRM's are TBD seconds, respectively, for both vacuum and sea level conditions for SRM's conditioned at 40 degrees, 60 degrees, 80 degrees and 90 degrees F, for MEOP of 1000 psia.									

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1.1 Provide SRM Thrust	The limiting values of failoff times shall conform to these nominal times as modified by the 3 - sigma variance percentages of 0.77 and 0.80 percents, respectively, for web action time and action time.								

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1.2 Provide Simultaneous Burnout of Stage SRM's	Burnout begins upon sensing that the SRM's have completed burn and ends with a signal being received at the Orbiter indicating this condition has been achieved.								
	A. A means is required to determine SRM burnout. This will be defined as thrust decay to less than __TBD__ pounds force which occurs at approximately T + __135__ seconds.		SRM Pressure Transducers						
	B. A requirement exists to condition the motor burnout signal for transmission. Signal shall be __TBD__ volts __TBD__ amps.		SRM Pressure Transducers						
	C. A requirement exists to transmit the motor burnout signal from the sensing device to the SRM/Space Shuttle interface.		SRM Cabling						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 1.0 PERFORM FLIGHT MISSION OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
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1.3 Disable All Unneeded Ordnance	Disable all unneeded ordnance begins after signal is received at the orbiter that the SRM's have completed their burn and ends upon receipt of ordnance disabled signal at the orbiter.								
	A. The ISDS,TT system and TVC unused ordnance must be capable of being disabled prior to initiation of SRM separation upon receipt of command signal from the orbiter consisting of 28 ± 3 volts, 3 amps for a period of 2 to 5 seconds.		Destruct System TT System TVC System						
	B. A means is required to transmit the command signal from the SRM Space Shuttle interface to the ISDS, TT system and TVC system.		SRM Cabling						
	C. The ordnance disabled signal shall be conditioned to 28 ± 3 vds, 3 amps.		SRM ISDS System						
	D. The ordnance disabled signal shall be transmitted to the SRM Space Shuttle interface.		SRM Cabling						

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1.4 Provide SRM Steering & Control	Provide SRM Steering and Control begins after SRM ignition and continues until SRM burnout. A. There is a requirement to provide steering and control of the missile. The SRM's, with °of thrust misalignment, require no TVC. If ° cannot be met, then TVC is required for the SRM's <u>Alternate #1 - TVC Required</u> A requirement exists to provide a TVC system which has the means of providing pitch, yaw and roll control, as required, as directed by the orbiter flight control system. 1. Side Force Requirements. A minimum side force to motor axial thrust ratio of TBD percent shall be a capability of the TVC system throughout the action time, with motor operating up to an altitude of TBD feet. This side force is to be obtainable from any one quadrant, independently of side force developed in any other quadrant. 2. Thrust Vector. The line of action of thrust vector under full thrust conditions and zero degrees thrust vector control deflection shall be within TBD (half angle) cone symmetrical about a line coincident with, or parallel to the line joining the center of the exit plan of the nozzle to the center of the throat.		SRM Stage						

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1.4 Provide SRM Steering & Control	3. Required Duty Cycle. The required duty cycle shall be TBD 4. Environment. TVC system shall suffer no degradation of performance during and after exposure to the following environments: TBD 5. Weights and Center of Gravity. The weight and center of gravity of the TVC system hardware shall conform to the requirements of TBD Alternate #2 - No TVC A requirement exists to provide the proper orientation of the SRM thrust line relative to the Space Shuttle longitudinal centerline. The SRM pitch plane is defined as that plane passing through the centerline of SRM and LOX/ tank of the Space Shuttle. 1. Pitch Plane Requirements: a. Nozzle to be canted outboard at a TBD $\pm$ 1/4 degree angle relative to the SRM longitudinal centerline. 2. Yaw Plane Requirements: a. Nozzle to be at a zero $\pm$ 1/4 degree angle relative to SRM longitudinal centerline.									

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1.5 SRM Withstand Loads and Environments	"SRM Withstand Loads and Environments" starts upon ignition of the Space Shuttle engines and ends upon splashdown of SRM hardware. A. The SRM's shall withstand the combinations of environment conditions and loads; such as, thrust and aerodynamic forces which it experiences, in a manner which maintains structural integrity. B. Load Safety Factors - The structure shall have load safety factors that satisfy reliability apportionment but are consistent with requirements of weight, ground hazards to personnel and man rating requirements. Safety shall not be sacrificed for weight improvements. C. Consideration in the design of the SRM's and components include: 1. Thrust: Structural requirements primarily result from thrust loads and variations which occur throughout powered flight. Local buckling under compressive and bending loads is an example of a possible result of thrust. See function 1.1, "Provide SRM Thrust."		SRM Stage						

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1.5 SRM Withstand Loads and Environments	2. Time: SRM loads vary with time and corresponding mission phase. Also, time is a factor of variables; such as, weight and center of gravity and of cumulative structural characteristics; such as, fatigue and creep rate. 3. Vibration: During flight, the SRM experiences complex vibrations including random and sinusoidal. The sinusoids are primarily caused by resonant motor and/or engine combustion, instability at burnout, and steering oscillations. The random vibration is primarily caused by noise from motor and/or engine acoustic and aerodynamic excitations. Vibration of maximum severity occurs at liftoff, through the transonic speed region, near the period of maximum aerodynamic pressure (max. q), and during ignition and burnout periods of each stage. 4. Acoustic Field: This has a broad band harmonic content arising from sources such as, boundary layer turbulence, engines and/or motors, and high velocity propellant flows. Periods of maximum severity are at liftoff, during transonic flight, and near the period of maximum aerodynamic pressure (max. q).								

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1.5 SRM Withstand Loads and Environments	5. Buffet: This is associated with the instability of the boundary layer air flow over the vehicle surface. Variable air loads are set up due to intermittent flow separation or to turbulent wakes passing over vehicle surfaces. The structural response involves both rigid and flexible structure degrees of freedom. Buffeting is random in nature and usually reaches its peak during the transonic period of flight. 6. Aerodynamic Flutter: This is identified as an aerodynamic - structural vibration of surfaces involving several structural degrees of freedom. It is involved in structural stiffness levels with mach number and altitude. 7. Panel Flutter: This is characterized by high frequency instability of local panels or areas of the vehicle surface. It is one of the considerations for panel thickness, edge restraint, geometry, and stiffener location.								

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1.5 SRM Withstand Loads and Environments	8. Temperature: Temperature is involved with the heat absorption capability of the mass of the vehicle and affects structural properties; such as, elasticity, allowable stresses and creep rate. a. Aerodynamic Heating: Surfaces exposed to the air stream are subject to frictional heating throughout the atmospheric range of flight at a rate dependent on air density, air flow velocity, drag, and local air turbulence. After the vehicle reaches sonic velocity, the structure is subjected to aerodynamic heating for the remainder of boosted flight. b. Airloads: The maximum airload trajectory is determined by superimposing a wind profile on a reference trajectory. Since structural bending greatly influences the final airload distribution, the critical structural design cases must be determined by aeroelastic analysis.								

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1.5 SRM Withstand Loads and Environments	Therefore, airload distribution must be made for a range of mach numbers matching those from a range of trajectories containing the most critical load case. c. Thermal radiation from aerodynamically heated structures. d. Heat transfer between equipment and/or propellants and structural members. e. Solar radiation. Sunlit surfaces receive a maximum thermal flux of 442 BUT/Ft^2/Hr. f. Emitted and reflected thermal radiation from the earth. g. Rocket exhaust radiation and convection with base recirculation. During the atmospheric period of flight, an aerodynamic condition will occur which will result in an underpressure condition at the base of the vehicle.								

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1.5 SRM Withstand Loads and Environments	This condition combined with the pressure differentials of the rocket exhaust gasses will cause recirculation of the hot rocket exhaust gasses into the base of the vehicle. h. Internal Heat Sources: Operation of electronic systems, power supplies, propellant and other systems generates heat. i. Thermal Stress: This is a result of different expansion characteristics of different metals and of differences in temperature in the vehicle. j. Latent Heat: This is concerned with the heat level of the entire vehicle, including propellants and equipment, and is composed of heat resulting during flight and residual heat at liftoff. 9. Shock: Launch and staging shocks will be experienced by components.								

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1.5 SRM Withstand Loads and Environments	10. Maneuvering Loads: These are bending moments and axial loads resulting from normal maneuvering. They are involved with variations and tolerances in aerodynamic characteristics, vehicle flexibilities and natural frequencies, flight control characteristics and thrust level. 11. Aerodynamic Pressure: The SRM's experience this in varying degrees throughout atmospheric flight. It reaches its maximum when the product of air density and the square of the velocity are at maximum. This period is termed the "Period of Maximum Aerodynamic Pressure" or "max. q." 12. Misalignment: The effects of allowable structural misalignment and other permissible and expected tolerances occur throughout SRM flight. 13. Staging Loads: These include separation forces and possible vehicle motion due to wind disturbance. The SRM shall suffer no degradation of performance from the environment induced by separation.								

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1.5 SRM Withstand Loads and Environments	14. Wind and Gusts: Effects of wind and gusts must be considered during atmospheric flight as follows: a. Ground Winds and Gusts: These winds shall be considered applicable in two ways: (1) One hundred percent steady wind (2) Two-thirds steady wind and one-third gust The dynamic pressure due to gust shall be applied as a (cosine) function, critically phased to produce maximum loadings in the vehicle. Gust effects shall be examined by rational random turbulence analysis when adequate data are available. The maximum total dynamic pressure in Case (1) shall be the same as in Case (2). b. Airborne Winds and Gusts: The SRM's shall suffer no degradation of performance when exposed to the following flight and wind gusts.								

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1.5 SRM Withstand Loads and Environments	(1) Wind (TBD) (2) Wind Shear (TBD) (3) Gusts: Gusts shall be considered through 75,000 ft. altitude. c. Design of Synthetic Wind Profile: Design of a synthetic wind profile shall be accomplished as shown in __________. 15. Atmospheric Properties: Properties; such as, air density, temperature, and/or humidity affect the SRM's during atmospheric flight. Atmospheric properties shall be those specified in "United States Standard Atmosphere, 1962," United States Government Printing Office, Washington 25, D.C., December 1962. Altitude will increase from sea level to above the atmosphere (vacuum conditions) at a rate dependent on the flight profile. 16. Acceleration: The SRM's withstand maximum forward and lateral steady state and transient acceleration.								

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1.5 SRM Withstand Loads and Environments	17. Thrust Buildup, Differential, and Overshoot: These are experienced during rocket ignition periods. 18. Maximum Thrust Vector Control Side Force: This is associated with maneuvering and the flight control system. 19. Vehicle and Mount Structural Response Coupling: During the liftoff period, the SRM's experience the effects of the coupling of vehicle and launch pad structural responses. 20. Umbilical Disconnect: During the liftoff period, the SRM experiences moments imparted by the disconnection of umbilicals. Umbilicals attached to the SRM shall be so located and designed such that the disconnect of these umbilicals is not detrimental to SRM performance. D. Technical Requirements 1. Structure: The structure shall possess sufficient strength, rigidity, and other necessary physical characteristics required to survive the critical loading conditions that exist within the envelope of mission requirements.		SRM						

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1.5 SRM Withstand Loads and Environments	2. Thrust: The initial sea level thrust to be transmitted shall be a nominal ____________ pounds per SRM. The corresponding thrust values versus time for the remainder of the SRM Stage flight shall be established from the corresponding burning times total impulse and specific impulse requirements. E. Design Constraints 1. Structure: The structure shall be designed to adequately satisfy the structural design requirements and load conditions specified in ____________. 2. Environment: The structure shall withstand all environmental and load conditions imposed by SRM Stage flight phase as specified in ____________.								

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1.6 Meet Range Safety Requirements	Throughout the space shuttle system flight, range safety requirements must be met. Through monitoring of SRM and space shuttle critical parameters, following the trajectory of the vehicle with comparisions to expected trajectory and providing hardware inadvertent separation detection this condition can be ensured. Failure of the vehicle to meet range safety requirements may result in mission abort. No vehicle shall be intentionally allowed to assume a position that will permit the possibility of impacting in any critical area. Critical areas will be those designated by								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 1.6 Meet Range Safety Requirements OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
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1.6.1 **Detect Inadvertent SRM Separation**	**A. Should either SRM separate prematurely from the Space Shuttle, a means shall be provided to detect this condition and initiate a destruct.**		**SRM** **ISDS** **SRM Cabling**						
	B. The activation and detection mode shall require the loss (breaking) of redundant hot wires and redundant return wires. The hot wires and return wires will be supplied by Space Shuttle batteries and are to be connected through two separate harnesses to each SRM. Loss of all four wires will be detected by the SRM circuitry and destruct initiated. NOTE: This detection mode may be time delayed or completely eliminated if further trade-off and system performance studies so indicate.		**SRM** **ISDS** **SRM Cabling**						

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1.6.2 Provide SRM Manrating Requirements	The SRM's are a part of a manrated system and, therefore must satisfy system manrating requirements.								
	A. Factors of safety for SRM Stage critical components shall be as follows: 1. 1.2 Proof Test (on MEOP) 2. 1.4 Ultimate (on MEOP) 3. 2.0 (on thickness) Nozzle Ablator 4. 2.0 (on thickness) Case Insulation 5. 1.4 Ultimate on Interstage Structures		SRM Stage						
	B. Use of redundant components for dynamic systems as follows: 1. TVC Actuation 2. SRM Ignition Indicators and Command 3. Thrust Termination Initiators 4. Staging Initiators and Command 5. Destruct Initiators and Command, if required		SRM						
	C. Sensing of impending or commencing motor failure during operation.		SRM Pressure Transducers						
	D. Qualification testing of the SRM's and the assembled SRM/Space Shuttle. (Ref. LMSC-A995931, Vol. II, Pt. 3.)								

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1.6.3 Monitor SRM Functions	A. Throughout SRM Stage operation the critical functions of the SRM shall be monitored.		SRM Flight Instrumentation System						
	B. Signals shall be transmitted between the SRM/Space Shuttle interface. Signal levels shall be 28 ± 3 vdc, 200 milliamps		SRM Cabling						
	C. Signals shall be conditioned for transmittal to the Space Shuttle/Ground. They shall be conditioned to 28 ± 3 vdc 200 milliamps.		SRM Flight Instrumentation System						
	D. The SRM flight instrumentation system shall provide 12 channels of data.								
	E. The instrumentation system shall have an end-to-end demonstrated accuracy of TBD % (3 sigma). The output impedance shall be 5,000 ohms maximum or 1,000 ohms maximum shunted by 0.1 microfarad capacitance.								
	NOTE: No flight instrumentation failure shall cause a failure of the flight vehicle.								

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REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 1.0 PERFORM FLIGHT MISSION - 156" OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
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1.7 Separate SRM's from Space Shuttle	"Separate SRM Stage from Space Shuttle" begins after signal is received at the Space Shuttle orbiter that the unneeded ordnance has been disabled and ends upon SRM Stage splash-down.								
	A. A requirement exists to arm the separation ordnance upon receipt of 28 ± 3 vdc 3 amps for a period of 2 to 5 seconds.		SRM Separation Rocket S&A						
	B. A requirement exists to receive the separate command from the orbiter. The signal will consist of 28 ± 3 volts $9 \pm {}^{2}_{0}$ amps for a period from 250 to 750 milliseconds.		SRM Cabling						
	C. The SRM's must react to the separate command within second.		SRM Separation System						
	D. The SRM's must separate without causing damage to the Space Shuttle or the SRM hardware.		SRM Separation System						
	E. A means is required to lower the SRM hardware to the ocean at a velocity not to exceed		SRM Recovery System						
	F. The SRM hardware must be capable of withstanding splashdown without damage to the case, aft skirt extension, APU, power supply and distribution system and nozzle, or, sinking in the ocean.		SRM Recovery System						

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1.7 Separate SRM's from Space Shuttle (Continued)	G. A means is required to transmit the separation command signal from the SRM Space Shuttle interface to the SRM separation system		SRM Cabling						
	H. Just following separation of the SRM Stage the recovery system power and ordnance shall be enabled upon receipt of the separation indication signal of TBD		SRM Recovery System						

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2.0 Perform Terminal Countdown & Launch	The countdown will continue thru the terminal count after flight readiness has been attained. The requirements for time limitations to the Terminal Countdown with respect to any launch window requirements, the elimination of any possible human error in regard to sequencing critical functions, and the complexity and quantity of inputs to be monitored make it imperative that the Terminal Countdown and Launch be automatic with the capability of manual hold or shutdown. The prevention of inadvertant damage or loss of the vehicle or ground equipment must be considered as a part of this requirement. The terminal countdown is defined as the automatically sequenced portion of the launch sequence and ends upon electrical separation of the SRM's to ground. A. Human Factors Engineering Criteria shall be applied in the identification, design and layout of the equipment associated with the Terminal Countdown and Launch. B. The equipment shall be designed to ensure that interactions between personnel and equipment have been adequately considered and that the potential hazards to personnel and equipment are minimized. C. The design of the launch control equipment shall be conducive to maximum effectiveness of the man-machine								

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2.0 Perform Terminal Countdown & Launch (Continued)	combination and shall minimize equipment demands upon human skill, training, and quantitative manpower. Whenever possible manual manipulations shall be a matter of simple acquired reflex operations requiring little conscious effect or attention, after a minimum of training. D. Design considerations shall provide maximum safety to personnel and equipment. E. The safety considerations for personnel shall take precedence over those for equipment. Specific safety considerations for personnel which take precedence over those for equipment are identified through proper considerations of safety criteria during design stages. Personnel safety and equipment safety have a direct interface and the action of one exerts a strong effect upon the other. Safety design requirements shall not degrade the normal operation of the system. An adequate communication system shall be provided at all points directly involved in the Terminal Countdown and Launch operations, including a safety/hazard warning communications loop and public address system adequate for reaching all personnel engaged in accomplishing these functions. Particular attention shall be given to launch crew activities and equipment requirements.								

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2.1 Perform SRM System Checks	A. A countdown steering test will be initiated at approximately ________ seconds in order to verify integrated flight control computer and SRM thrust vector control steering signal response. The test will validate the ability of the guidance system to issue steering signals of proper magnitude and polarity to the flight control system by monitoring proper system response to known, preestablished control signals. The test will be performed just prior to vehicle launching and will consist of the following: 1. Initiate a pitch down yaw left command to the TVC systems of each SRM and verify. 2. When verification is made the signals will be removed and the return of all TVC components to the null position will be monitored. 3. Initiate a pitch down yaw right command to the TVC systems of each SRM and verify. 4. When verification is made the signals will be removed and the return of all TVC components to the null position will be monitored. The countdown steering test will be completed by ______ seconds or a launch hold will be generated.		Control Monitor Group Thrust Vector Control System Flight Control System						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 2.0 Perform Terminal Countdown & Launch OR NOMENCLATURE AND NO. OF CEI			EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS					PROCEDURAL DATA REQUIREMENTS
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2.1 Perform SRM System Checks (Continued)	B.	Test SRM Ignition Circuits A test current will be sent thru the SRM ignition circuitry at seconds in order to obtain assurance that the SRM igniters will fire when actually required to do so. This test also performs a final reliability verification of ignition circuit installation since previous tests were performed with a dummy unit. The test will be performed with the safe and arm devices in the safe position. Stray voltage detectors will be utilized to verify the presence of the test current. The test current will be sized at approximately milliamps which is twice the trip level of an SVD and still less than the initiator "NO FIRE" current. Failure to "FIRE" the four initiator SVD's will result in generation of a hold.		Ordnance System Control Center Power Distribution Control Launch Control Console							
	C.	Test signals and commands for the above tests along with verification signals will be as follows and must be transmitted and/or provided by the SRM: TBD		SRM Cabling & Signal Conditioning							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 2.0 Perform Terminal Countdown & Launch OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
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2.2 Arm Destruct & TT Ordnance	A. At approximately TBD seconds the TT and destruct ordnance safe and arm device shall be armed. This arming shall establish continuity between the firing circuit and the detonators and remove the shunt across the detonators. Application of 28 + 3 VDC with 3 amperes maximum current is required to arm the ordnance safe and arm devices.		Control Monitor Group						
	B. The inadvertent separation & TT system shall also be armed at this time in order that inadvertent separation can result in the required stage TT. Application of 28 ± 3 vdc with capability of 3 amp maximum to an enable/disable switch will be required for [illegible] arming.		SRM Ordnance						
	C. The arm commands must be transmitted within the SRM's.		SRM Cabling						
	D. Indication of ordnance arm shall be provided to the orbiter and ground systems. This function is required to be completed prior to flight operations.		SRM Ordnance						

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REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 2.0 Perform Terminal Countdown & Launch OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
2.3 Arm SRM Ignition Ordnance	A. The SRM 1 & 2 ignition safing and arming circuitry and devices will be armed at seconds. Arming at a late period in the countdown will positively preclude any possibility of inadvertent SRM ignition except at tbd seconds and will best satisfy the requirements of the system.		Control Monitor Group						
	B. Arming of the ignition safe and arm device will establish continuity between the firing circuit and the detonators and remove the shunt across the detonators. 28±3 VDC at 3 amps maximum will arm the safe and arm device.		SRM Ordnance						
	C. Items prerequisite to ignition circuit arming will be satisfactory accomplishment of the hold lockout and no initiation of a manual shutdown.								
	D. The arm signals must be transmitted within the SRM's.		SRM Cabling						
	E. Indication of ignition ordnance arm condition shall be provided.		SRM Ordnance						

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2.4 Ignite SRM's	At seconds, means shall be provided to ignite SRM 1 and 2. A. The power to perform launch ignition functions shall be supplied from the ground to minimize airborne hardware requirements. In order to prevent excessive overturning moments, it is necessary to ignite both SRM's as close to the same time as possible and have the thrust build-up of both SRM's equal. The thrust build-up should have a ramp shape so that a small difference in ignition time will not cause a large difference in SRM thrust during thrust buildup. The maximum permissible time differential between ignition of the two SRM's shall be milliseconds. The maximum rate of thrust rise for either SRM (from 10% to 75% of F max.) shall be TBD lbs/ms. The minimum rate of thrust rise for either SRM (from 10% to 75% of F max.) shall be TBD lb_f/ms. An ignition train of three sequential amplification steps is required in order to provide sufficient energy to properly ignite the SRM propellant surface with reliability and reproducibility. 1. Ignite pellets in pellet basket. 2. Ignite initiator. 3. Ignite igniter motor.		Control Monitor Group Power Distribution Control Power Supply SRM Ordnance System SRM						

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2.4 Ignite SRM's (Continued)	B. The SRM's must receive ignition power and command through the shuttle vehicle from ground command. For this function the current requirement is 4.5 amps ($\pm\frac{1}{0}$) per bridgewire. The power signal from the ground shall initiate the dual bridgewires located in the SRM igniter safe and arm. C. Conversion of electrical energy to pyrotechnic energy shall be transmitted to the ignition system via the electrically energized squibs. Ignition delay, time interval between fire squib signal, and start of pyrotechnic action time shall be less than 500 milliseconds. Each squib shall have a minimum caloric output of calories and shall be capable of igniting boron potassium nitrate pellets. D. The safe and arm pellet basket shall be loaded with a pyrotechnic mixture. It shall receive the small energy output from the squibs and amplify and transmit the energy to the igniter primary initiator which is the next phase of the ignition train. SRM ignition shall be reliable and reproducible at all temperatures between 60° - 90° F. Ignition delay time shall be .118 sec nominal. Limits on ignition delay time are TBD.								

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2.4 Ignite SRM's (Continued)	E. Heat and hot particles from the pellet basket initiates propellant burning in the initiator The energy received is new reamplified and transmitted to the SRM igniter motor grain by thrusting heat and hot particles through nozzles on the initiator. The nozzles direct the hot gas particles to the SRM igniter motor to promote uniform combusion of the surface. F. Heat and hot particles from the initiator will initiate propellant burning in the igniter motor. The igniter phase is the last amplification stage in the ignition system. Sufficient energy is available from the igniter to elevate the motor propellant surface to the necessary ignition temperature and develop the initial minimum chamber pressure to insure stable grain combustion. The amplified igniter motor energy is transmitted to the SRM propellant surface grain by thrusting heat and hot particles through nozzles. The nozzles direct the hot gas particles to the SRM grain to promote uniform combustion of the surface. G. Energetic products from the igniter motor will elevate the propellant surface to the temperature required for ignition of the propellant grain. Concurrently, sufficient hot gases will be transmitted to the combustion chamber to insure that propellant burning will continue with stable								

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2.4 Ignite SRM's (Continued)	operating characteristics. H. It is necessary to have proper SRM chamber pressure buildup so that the thrust developed at launch is adequate for liftoff without drift or control problems. The chamber pressure ignition transient from 50% to 100% of maximum chamber pressure is such that the differential chamber pressure between any two motors will not exceed TBD of the maximum chamber pressure.								

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2.5 Lift-Off	At approximately T + milliseconds the SRM thrust will exceed the total vehicle weight and the vehicle will rise from or lift-off the launch pad. The flight necessary ground to vehicle umbilicals will be designed to disconnect and pull away within the first second after vehicle lift-off occurrence.		SRM Stage						

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2.6 Provide Return To Safe Capability	A. Capability shall be provided to automatically return the vehicle to a safe condition in the event of a hold occurring during the terminal count. A safe condition shall be defined as returning to the same vehicle status, with the exception of expended pressurization and propellant system ordnance, as immediately prior to entering the terminal countdown. This requirement is necessary to allow personnel to return to the launch pad area. 1. The equipment shall be capable of performing the following if a hold occurs prior to seconds. a. Return all safe and arm devices to safe position if previously armed. All SRM safe and arm devices must be in the safe position to prevent inadvertent operation of the initiators during a hold period. The igniter safe and arm must be safed and confirmed safe prior to safing the destruct and TT safe and arm in order to maintain a destruct and TT capability at all times when the igniters are armed. (1) The igniters must be returned to a safe position to prevent inadvertent motor ignition. Returning the igniter safe and arm device to the safe position shall remove continuity between the		SRM Ordnance Control Center Power Distribution Control Launch Control Console						

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2.6 Provide Return to Safe Capability (Continued)	firing circuit and the squibs and place a shunt across the squibs. Application of 28+3 VDC with 3 amps maximum current is required to safe the igniter safe and arm device. (2) Verify that the igniter safe and arm is in a safe position. Indication of igniter safe and arm in a safe position is given by a ground closure on a igniter initiator safe monitor circuit. Igniter safe indication shall appear in the Tracking and Flight Safety Monitor equipment. (3) The SRM destruct and TT safe and arm must be returned to the safe position to prevent inadvertent firing of the intiators. Returning the the destruct and TT safe and arm devices to the safe position shall remove continuity between the firing circuit and the detonators and place a shunt across the detonators. Application of 28+3 VDC with 3 amps maximum current is required to safe the destruct and TT safe and arm devices.								

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	EQUIPMENT IDENTIFICATION: NOMENCLATURE	EQUIPMENT IDENTIFICATION: CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS: TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
2.6 Provide Return to Safe Capability (Continued)	(4) Verify that the SRM destruct and TT arm are returned to the safe position. Indication of destruct and TT safe and arm in safe position is given by a ground closure on a 200 ma. TT initiator safe monitor circuit. Destruct and TT safe indication shall appear in the Tracking and Flight Safety monitor equipment. b. The SRM flight instrumentation system might be returned to ground power for operation during any hold period. Continued operation on battery power would reduce available battery time for flight. (1) Placing the IPS switches in the external position removes airborne power and supplies ground power to the instrumentation system. A 28 $\pm$ 3 volt dc signal with a maximum current of 3 amperes is required to operate the switch. (2) The IPS switch should be verified in the external position by the appearance of a 28 volt 200 milliampere indicator signal. c. The TVC actuation system must be turned off in the event of a hold. (Details to be furnished.)								

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3.0 Establish and Maintain Readiness	The Establish and Maintain Readiness sequence covers all requirements to establish flight readiness after the Space Shuttle System has been erected and the combined system test is complete.								

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3.1 Install Airborne Batteries	In order to reduce personnel hazard the Airborne (A/B) Batteries must be installed and connected prior to propellant loading in the Space Shuttle. A. The batteries must be delivered in a tested full charge condition. They shall be visually inspected for the following conditions: 1. Bent or punctured battery case. 2. Broke, cracked, or displaced cells. 3. Damaged connectors or plugs. 4. Improper identification or marking. 5. Improper records of battery activation and charge, or evidence supporting the loss of capability, or remaining in the fully charged condition for 30 days under no load condition. 6. Heating gassing or other detrimental effects occurring during battery stand time. If any of the above conditions exist the battery shall be rejected.	Eye baths, showers, and other necessary first aid equipment shall be readily available in areas where toxic materials are to be handled. A facility shall be provided for neutralization or flushing of harmful material (electrolyte) on equipment or personnel. Sufficient lighting means shall be provided adjacent to and in the areas of installation of airborne batteries. The lighting shall be appropriate for installation of equipment and be capable of delivering between 25 and 50 ft. candles of illumination. Work platforms and access panel storage is required at vehicle station to allow SRM battery installation.							

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3.1 Install Airborne Batteries (Continued)	B. Approximate installation location: Battery / Qty / Comp. / Maximum Weight (Each) SRM Flight Instrumentation Power Supply / 2 or 3 / SRM 1, SRM 2, SRM 3 / 53 lbs SRM ISDS Power Supply / 2 or 3 / SRM 1, SRM 2, SRM 3 / 53 lbs SRM Recovery System Power Supply / 2 or 3 / SRM 1, SRM 2, SRM 3 / lbs C. Battery shall be load tested after installation to verify battery condition and installation. The load test shall be performed via the ground power umbilical. This load test will be accomplished by Function 3.3.	A facility area shall be supplied for a battery shop. Approximately 200 sq ft are required.							

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3.2 Install Ordnance	A. To satisfy personnel safety requirements all ordnance items with the exception of the destruct initiators must be installed prior to propellant loading. The electrical hookup of ordnance will not be accomplished until propellant loading is complete The SRM ordnance items to be installed at this time are as follows: Installation Data: SRM Igniter Safe and Arm Device (1 each SRM) Pounds: Length: Diameter: Separation Motor Igniters Pounds: Length: Diameter: Recovery System Safe & Arm Devices Pounds: Length: Diameter:		Service Platform Set						

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3.2 Install Ordnance (Continued)	Solid rocket motor installation requirements are as follows: 1. The flight igniter safety and arming device must be installed in an unarmed "safe" position and not be electrically connected until the T count. Igniter safe and arm hold-down bolts must be torqued between and inch-pounds and safety wired for pressure retention of primary seal.								

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3.2 Install Ordnance (Continued)	2. The separation ordnance must be installed to provide complete mechanical buildup of separation devices required for insuring a clean separation of space shuttle and SRM's during staging phase of flight. 3. AGE simulators and simulator cabling must be removed from the nose section, of the SRM's. The SRM destruct initiator (1 each) shall be installed within the nose section of each solid motor. Fasteners shall be torqued and lock-wired in place. Safe and arm device characteristics are: Weight: Diameter: Length: 4. The recovery system ordnance must be installed.								

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3.3 Perform SRM Verification	A.	A requirement exists to minimize the risk of launching a vehicle with an undetected malfunction. Critical subsystems, or portions of subsystems most succeptable to time or power on failure must be checked as late in the countdown as possible. A vehicle verification check should be run before removal of the MST so as to provide access to the vheicle without unnecessary delay if a malfunction is discovered. A second vehicle verification should be run as a verification of flight readiness just prior to launch. The subsystems or functions to be tested are: 1. Pressurization systems To accomplish the Flight Controls Functional Checkout, ground supplied signals are required to approximate Flight Controls Airborne equipment. The complete flight controls system must be utilized where possible, in as much an end-to-end checkout as can be obtained. Criteria for a good test is the proper operation of SRM TVC when compared with input signals.		Battery Test Set Battery Test Set Vehicle Checkout Set						

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3.3 Perform SRM Verification	2. The SRM ISDS battery must be subjected to a load test to verify a satisfactory potential. 3. The SRM Flight Instrumentation Power Supply must be subjected to a load test to verify a satisfactory potential. B. A Range Safety requirement exists to verify launch vehicle response to shutdown and destruct signals prior to launch. Ordnance simulators must be provided to verify the destruct signals are received and are capable of actuating the destruct devices.		Ordnance Simulators						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 3.0 ESTABLISH AND MAINTAIN READINESS OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
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3.4 Perform Stray Voltage Checks	A. Electrical connection of all ordnance cannot be accomplished until the propellant loading is completed. Prior to final ordnance installation connection, stray voltage checks must be performed on all ordnance circuitry to insure that no hazardous voltages are present. Any ordnance item to be connected will be connected immediately after performing the stray voltage check and insuring that excessive currents have not been sensed. Ordnance items to be installed at this time are: 1. All destruct initiators. CAUTION There must be NO R/F transmission taking place for the duration of this function (minutes). B. To satisfy ordnance handling and connection safety requirements an ordnance items test set is required. The OITS must accomplish the following checks:		Ordnance Test Set						

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3.4 Perform Stray Voltage Checks (Continued)	1. Check continuity of all ordnance devices. 2. Checkout of the destruct and TT systems by providing a means of detecting that no energy capable of initiating destruct or TT is received.								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 3.0 Establish and Maintain Readiness OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
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3.5 Install SRM Access Covers	A. The S/A, access covers should be permanently installed at this time. The nose fairing should be inspected to insure that it is permanently secured. Access shall be provided to the covers for installation.		Assembly and Maintenance Platform Set						

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3.6 Verify and Maintain SRM Flight Readiness	Subsequent to establishing flight readiness and immediately prior to the start of the terminal countdown it is required that the flight readiness be verified. Certain discrete signals in the launch control system must be automatically monitored by the control monitor equipment. Readiness monitoring must include the following indications, all of which must be present to result in the lack of a LAUNCH NO-GO condition on the launch control equipment. If any of these required signals are missing the capability of starting terminal countdown, 2.0, will be locked out automatically and unscheduled maintenance will be required. 1. TVC system check discrete. TBD								

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3.7 Connect Ordnance	The following ordnance shall be electrically connected: 1. Igniter safe and arm 2. Destruct safe and arm 3. Staging rockets safe and arm 4. TT safe and arm 5. Recovery system safe and arm Access to the ordnance connect points shall be provided.		Maintenance Platform						

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5.0 Integrate & Checkout Space Shuttle System	There is a requirement to integrate the Space Shuttle with the inplace SRM's. It will be the Integrating Contractors responsibility to perform this function. After completion of the integration, subsystem tests and combined systems tests must be run prior to transporting the Space Shuttle System to the launch pad.								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 5.0 Integrate and Checkout Space Shuttle System OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
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5.1 Install SRM A/B Simulation Equipment	Certain SRM subsystems functional operations are unique in that they do not require all stimulus or power from the orbiter. Further, there are some SRM operational characteristics which are not checked out during the CST and must be previously verified for successfully accomplishing the CST. These tests include, but are not limited to the following: Vehicle Safety Subsystem Test Flight Instrumentation Subsystem Test Thrust Vector Control Subsystem Test A. Prerequisites to beginning SRM launch pad subsystem tests include the installation of simulators, provisions for power, and various test sets for performing accuracy checks. 1. Simulators are utilized where actual operations of solid motor equipment would necessitate replacement before actual flight or where operation of the equipment would be hazardous to personnel. They are temporarily installed in or around the solid motor where operation of the equipment would be hazardous to personnel. They are temporarily installed in or around the solid motor where they are connected in a manner which utilizes the actual solid motor signal distrubution network. They may have temporary connections to test sets or other simulators.		Ordnance Simulators						

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5.1 Install SRM A/B Simulation Equipment (Continued)	a. Access panel removal is required to facilitate the installation of TVC and ordnance simulators and test equipment. Access panel removal requires that personnel access be provided at ___ radial location. Access panel storage must also be provided. Panel dimensions are: Length: Width: Weight: b. Removal of the Nose Fairing Section is required to facilitate installation of ordnance simulators. Personnel access must be provided around the nose fairing section at VS for removal of the fairing attaching bolts. B. A lifting device is required for removing the nose fairing section. Nose fairing dimensions are: Diameter: Length: Weight: A temporary attachment is required on the nose fairing section on the service tower.	A work platform is required in the vicinity of VS radial location. Access panel dimensions are: Length: Width: Weight. Access panel storage must be provided. Work platform is required around the nose fairing section in the vicinity of A crane must be provided to lift the nose fairing from the forward closure section. Nose fairing dimensions are: Diameter: Length: Weight: Storage space is required on the service tower for the nose fairing section.							

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5.1 Install SRM A/B Simulation Equipment (Continued)	Temporary storage space is required for the nose fairing section on the service tower. C. Access is required to the nozzle assembly for installing simulators and test equipment. Personnel access must be provided at VS ___ radial location of ___. Temporary storage space is required for access panels. Access panel dimensions are: Length: Width: Weight: Installation of the TVC simulators is required. D. Installation of the ordnance simulators is required in the forward and aft sections of the SRM's to represent the actual SRM signal distribution network during pre-launch tests. E. Installation of the flight instrumentation simulators is required in the forward, TVC area and aft closure of the SRM's to represent actual SRM signal	Personnel work platform must be provided in the vicinity of VS ___ and radial location of ___ and from TDC. Temporary storage space must be provided for the access panels. Access panel dimensions are: Length: Width: Weight:								

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5.1 Install SRM A/B Simulation Equipment (Continued)	distribution network during prelaunch tests.								

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5.2 Perform SRM Subsystem Tests	The SRM safety subsystem test is performed to verify the operation of the SRM Destruct, Thrust Termination, and Inadvertent Separation Destruct System (ISDS) required for range safety, separate from the combined system test (CST) to allow verification of all abort initiation modes without rerunning the CST.								
	A. Simulators are required to give electrical simulation where actual operation of solid motor equipment would necessitate replacement before actual flight.		Simulators (S&A, Battery)						
	B. Installation of SRM ordnance simulators must be verified.								
	C. The inert safe and arm units must be transferred to the arm position upon a command of 28± 3 vdc 3 amps applied for 2 to 5 seconds.								
	D. Verify arm position achieved.								
	E. The separation of the SRM's from the space shuttle must be simulated to verify correct operation of the ISDS. The separation shall remove current from both hot wires. Maximum hot wire current shall be ma.								
	F. Verify no ISDS destruct output.								
	G. Parallel redundant disable lines are provided to protect the vehicle against								

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5.2 Perform SRM Subsystem Tests (Continued)	inadvertent ordnance operation. The redundancy feature must be tested by simulating breaking each wire independently. 1. Apply voltage to ISDS checkout cable to simulate breaking disable wire. 28 volts must be applied to the disable line through the checkout harness to simulate breaking the circuit. 2. Verify no output from squib firing circuit. There should be no output from the squib firing circuit because of the redundancy feature. Power applied to the disable line must be removed so that the test can proceed to verify the second disable line. 3. Power applied to both disable lines should fire the destruct simulator. H. A TT and command destruct signal will be sent from the command receiver to verify the TT and command destruct systems. A 4.5 $+1$ -0 ampere 28$\pm$ 3 volt signal will be sent on each of two destruct firing circuits per SRM. I. Receipt of the command destruct signal shall be verified.									

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5.2 Perform SRM Subsystem Tests (Continued)	J. A load test will be performed to verify the ground capability to perform the test and to check the battery condition. A 2.8 ohm load will be placed across the battery for 2 seconds. Battery voltage should be above 25 volts under load. K. Airborne instrumentation system shall be checked to insure that it is capable of monitoring the various vehicle functions, converting the information into transmittable data and passing it to ground stations. Where instrumentation measuring devices are not actually in operation, artificial stimuli must be produced and applied to the particular transducer to obtain an output. Care must be taken that the stimuli or simulation device applied to the transducer or to its circuitry, in the case where transducer simulation is impossible, approximates as closely as possible the conditions that will be actually encountered by the transducer. Simulated battery voltage must be provided from a power source.								

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5.2 Perform SRM Subsystem Tests (Continued)	L. The following battery must be simulated. Solid Rocket Motor Destruct Battery (1 per SRM). M. The following listed sequential functional capability for a hold must be confirmed. 1. Return S&A devices to safe position for: a. Igniters b. Destruct 2. Disable ISDS system N. During the hold check capability, the following solid motor conditions must be displayed. 1. S&A devices SAFE 2. Squib power removed (ordnance not armed) 3. ISDS system disabled								

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5.3 Perform Combined System Tests	A simulated terminal countdown must be performed as identical to the actual launch terminal count as practical. Installation of simulation devices, checkout, vehicle verification checks, and verification of monitors has brought the vehicle to the status required to perform a simulated terminal countdown. At this time the terminal countdown will be initiated and performed The requirements to be verified during terminal count will be those appearing in 2.0 "Perform Terminal Countdown and Launch."								

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6.0 Assemble and Checkout SRM Stage	During assembly and acceptance activities at two or three solid rocket motors (SRM's) will be completely assembled and checked out for each launch vehicle. This function is based on the analyses of one SRM throughout ensuing assembly and acceptance. SRM assembly and acceptance operations consist of those operations that must be performed prior to solid motor tests. The second assembly phase is performed after solid motor test and completes SRM assembly operations. The SRM must go through an acceptance phase after which environmental protection shall be provided as required. In accomplishing this function, the following must be considered: A. A service tower shall be provided to assist in the complete assembly and solid motor tests at the launch site. B. Provisions must be made for an aural and visual warning and alarm system to be installed per	A service facility for assembly buildup & checkout of the SRM is required. Requirements are as follows: A. The facility must be capable of erecting & servicing 2 or 3 SRM's as applicable.							

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6.0 (Continued)	c. Provisions must be made for a public address system. d. Lighting protection must be provided in accordance with the requirements of T.O. and the National Electric Code. e. Facility grounding system must consist of an underground static grounding network, an equipment ground, and an electrical system ground. Non-current carrying parts of electrical equipment, structural steel tanks, piping components, and static grounding devices must be interconnected by buried lateral connections to the complex underground grounding system. Protection must be provided against corrosion caused by galvanic action of dissimilar metals. Accessible ground plates or a flat bus must be provided for grounding connections, as a continuous ground must be maintained on the SRM live components during unloading from the transfer medium and assembly of the SRM. The resistance to ground must not exceed 6 ohms as measured by any one of the methods specified by AIEE Master Test Code for resistance measurements. If it appears that the 5 ohm value can be achieved only at abnormally high cost, it may be necessary to relax this requirement.	b. A bridge crane near the top of the facility is required for handling SRM subassemblies and components. It shall be capable of lifting, moving, and inching components with weights approaching 200 tons. An auxiliary hook is necessary for handling components under 10 tons. The bridge crane shall be provided with an audible alarm to be sounded when moving loaded segments and closures. The crane runway shall be oriented and extended in such a direction that the loaded segments may be unloaded from a trailer and placed at the launch support without reorientation of the trailer.							

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6.0 (Continued)	f. Due to the hazardous nature of the Class 2 propellant contained in the cbbsures and segments, provisions must be made for the generation of safety procedures for the protection and guidance of personnel. g. The propellant bulk of each solid rocket motor must be maintained between 40°F and 90°F. The propellant temperatures between SRM's must not differ more than 10°F. h. A system of piping is required with associated control values and pressure indicators to effect proper distribution of gaseous nitrogen (GN_2) to various platform levels and work stations. The distribution system shall provide pressurized gas leak checks and pneumatic tool operation (125 psig). The system shall (1) function under varying fluid pressures. (2) interface with the facility pressure reduction station at the performance of dew point tests and cleanliness tests. and (4) ensure that GN_2 solid partial contamination does not exceed the permissible level During assembly activities, SRM components will be unloaded as needed, positioned and assembled in a natural buildup sequence.	c. Service platforms are necessary at all levels of SRM installation for assembly and checkout. All platforms shall have a minimum of 6 feet 10 inch clear head room. Platform shall either be portable or retractable and must enclose the SRM's for complete accessability at all service levels.							

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6.0 Assemble and Checkout SRM Stage (Continued)	The following subassemblies and major components shall be assembled together prior to subsystems checkout: 1. Nose cone subassembly 2. Segment subassemblies 3. Aft skirt extension 4. Destruct system 5. Cable assemblies 6. SRM Integration hardware The SRM must be assembled in its launch position on the launch supports. The aft segment and center segments shall be mated together followed by the forward segment. Each segment shall be mated by means of clevis joints. Finally, external electrical cables shall be installed in a vertical raceway which includes the shaped charges of the destruct system reaching from the forward closure to the aft closure. Technical requirements which are basic and general to the function are as follows:								
	A. A structural framework is required for each SRM to function as its foundation until "lift-off." The frame must interface between three support points on the aft skirt extension.		Crawler, Transporter						

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6.0 (Continued)	The following subassemblies and major components shall be assembled together prior to subsystems checkout: a. Nose Section Assembly b. Segment Assembly c. Aft case Extension d. Destruct System e. Cable Assemblies f. SRM Integration Hardware g. FWD Closure Assembly h. Aft Closure Assembly The SRM must be assembled in its launch position on the launch supports. The aft closure and loaded segments shall be mated together followed by the forward closure. Each closure and segment shall be mated by means of clevis joints. Finally, external electrical cables shall be installed in a vertical raceway which includes the shaped charges of the destruct system reaching from the forward closure to the aft closure. Technical requirements which are basic and general to the function are as follows: a. A structural framework is required for each SRM to function as its foundation until "lift-off". The frame must interface between three support points on the aft closure		Crawler, Transporter						

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NOMENCLATURE AND NO. OF CEI ____

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6.0 (Continued)	above, and the launch deck below. The frame must support, by means of adjustable jack points, the total combined weight of the SRM and one-half of the loaded Space Shuttle. Consideration must be given to the following: 1. SRM diameter: 156 inches 2. SRM height: approximately 150 feet 3. SRM weight: 1.3 million pounds, 2 segment 1.6 million lbs, 3 segment.								
	b. Live components, (loaded closure and segments must be grounded at all times. When the closure or segment is transferred and suspended from the bridge crane, a tag line grounding operation must be utilized. Live components must be lifted clear from transporter prior to disconnecting the ground lead. When setting the live component down, this connection of the ground lead must be made prior to contact with the AGE items or another closure or segment		Lead, Electrical						
	c. Provisions must be made for protecting the propellant surface of the aft closure and segments during assembly buildup. Protective covers must not be removed prior to mating the closures or segments.		Cover, Protective Propellent						
	d. A visual inspection of each component must be given at time of unpacking and assembly to check for possible damage during transfer.								

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6.1 Position Aft Skirt Extension on Assy Platform	The aft skirt extension must be assembled and positioned on the assembly platform such that it will support the rocket motor in its assembled state - within the required alignment limitations of ____________.				6.1 Position aft skirt extension on assy platform.				Assy Procedures
					6.1.1 Install skirt segments on alignment guide.	.5	3 Men		
	A. A means is required to support and align the aft skirt extension during rocket motor build-up.		Alignment and Assembly Guide(P.O. Crawler Transporter)		6.1.2 Attach skirt segments to each other.	.5	3 Men		
	B. A means is required to lift the skirt segments during assembly	Over head hoist	Lifting Sling		6.1.3 Adjust skirt into proper position for rocket motor build-up.	1.0	3 Men		
	C. The Aft skirt extension physical characteristics are as follows: 1. Weight -- Parallel Burn Series Burn 2. Diameter -- Parallel Burn Series Burn 3. Length -- Parallel Burn Series Burn								
	D. A means is required to check for the proper alignment of the in-place aft skirt extension		Theodolite						

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6.2 Position Aft Segment on Aft Skirt Extension	The aft segment assembly shall be unloaded from the transporter, inverted, moved, positioned and installed on the launch support. In accomplishing this function, consideration must be given to the following:		Lifting Device Breakover Stand		6.2 Position aft segment on aft skirt extension. 6.2.1 Remove protective covers.	.75	3 men		Assy Procedures
	a. Dimension of the aft assembly is 13 feet 2 inches in diameter and 23 1/2 feet long				6.2.2 Install lifting Device on segment	.5	3 men		
					6.2.3 Lift segment & position over breakover stand.	.25	3 men		
	b. The aft assembly weighs 166,000 lbs The environmental protection must be removed prior to closure movement.	Overhead Hoist	Sling		6.2.4 Lower segment onto breakover stand.	.25	3 men		
	c. Aft assembly handling equipment is required which will attach to the facility overhead bridge hook. It shall lift the aft closure from the transfer medium, invert it to an in-flight attitude, move it to a position above the launch supports and lower it into place.	Bridge crane with overhead lifting capacity to handle 100 tons.			6.2.5 Clean segment interfaces & install "O" ring.	1.0	2 men		
					6.2.6 Breakover segment into vertical position.	.25	3 men		
	d. The loaded acceleration of the bridge hoist and trolley must not exceed 0.5 g's.				6.2.7 Raise segment & position over aft segment.	.25	3 men		
					6.2.8 Lower segment into position.	.50	3 men		
	e. The aft segment propellant cover and support adapter shall be removed prior to installation of the segment.		Slings, Single Leg and Multiple Leg Semi-trailer		6.2.9 Install pins & retainers	1.0	2 men		
	f. Access shall be provided to the SRM joints.	Work Platform	Maintenance Platform		6.2.10 Remove lifting device.	.5	3 men		

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6.3 Assemble Center Segment to Aft Segment	The assembly considerations for segment to segment are for the most part alike. The segment assembly shall be unloaded from the transfer medium and suspended above the floor level in a work area between the transfer medium and the motor support frame. Cleaning and visual inspection of mating surfaces is required. The segment shall be translated vertically and hoisted from the work area to the SRM buildup and carefully mated to the closure below. a. The "O" ring shall be installed in the groove of the aft segment just prior to assembly of center segment. b. A visual inspection must be performed to determine the following: 1. The mating surfaces are free from foreign material. 2. That no deficiency exists in the mating surface that may prevent proper mating. 3. That damage has not occurred to the segment during handling activities. 4. That the "O" ring is properly seated.	Lighting shall provide a minimum of 50 foot candles at working level.	Lifting Device Breakover Stand Mirror, Inspection		6.3 Assemble Center segment to aft segment. 6.3.1 The assembly of each center segment will be essentially the same as the assembly of the aft segment to the aft skirt extension.	5.25			Assy Procedure

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6.3 (Continued)	c. Handling equipment, attaching to the bridge crane hooks, is required to move the segment from the transport medium to a work area where it shall be supported about 60 inches above floor level. This height enables personnel to clean and lubricate the mating clevis joint. The same equipment shall translate the segment vertically and move to a position above the aft segment, sustain it during alignment and slowly inch it on to the closure for mating. The two mating surfaces shall be parallel within 0.1 inch at mating.	Bridge crane with overhead lifting capacity of 200 tons.	Lifting Device Breakover Stand						
	d. Access is required around the upper regions of the segment to attach the handling equipment of consideration "c" while the segment is on the transport medium.		Maintenance Platform						
	e. Segment physical characteristics: 1. Shape: Cylindrical 156"diameter by 27 ft. long. 2. Weight: 350,000 pounds								
	f. An access level is required for personnel to perform assembly activities.	Work Platform							

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6.3 (Continued)	g. The segment hoisting adapter and the protective cover for the segment propellant shall be detached and returned to the factory prior to further buildup. h. Loaded movement of the bridge hoist and trolly must not exceed an acceleration of 0.5 ft/sec. while handling live components.	Work Platform Crane	Sling, Semi-Trailer							

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6.4 Assemble Forward Segment	The forward segment shall be unloaded from the transfer medium and supported above floor level, in a work area between the transport medium and the motor support frame, designated for the cleaning and lubricating of the mating joint. Cleaning and visual inspection of mating surface is required. The closure shall be translated vertically and raised to the buildup area and carefully mated to the center segment. Attachment is identical to that of any segment. In accomplishing this function consideration must be given to the following:		Lifting Device Breakover Stand		6.4 Assemble forward segment. 6.4.1 The assembly of the forward segment will be essentially the same as the assembly of each center segment.	5.25			Assy Procedure
	a. Same as 6.3 consideration "a".								
	b. Same as 6.3 consideration "b".	Work Platform							
	c. Same as 6.3 consideration "d".								
	d. Handling equipment, which will attach to the bridge hook, is required to move the forward closure from the transport medium to a work area where it shall be supported about 60 inches above the floor level.	Bridge Crane with Overhead lifting capacity to handle 200 tons.	Sling, Lifting Device Breakover Stand						

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
6.4 (Continued)	e. Forward segment physical characteristics: Shape: Cylindrical on the lower part and conical above, 156 diameter by 21 feet long. Weight: 166,000 pounds.								
	f. An access level is required for personnel assembly activities.	Work platform							
	g. Same as 6.3 consideration "g".								
	h. Same as 6.3 consideration "h".								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 6.0 ASSEMBLE AND CHECKOUT SRM STAGE OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
6.5 Install Electrical Cables and SRM Raceway	A. The special purpose cable assemblies shall be accessible for cable installation.	Personnel Access Platforms			6.5 Install electrical cables and SRM raceway.				Assembly Procedures
	B. Access must be provided at each platform elevation between the platform and the raceway to allow each cable assembly to be raised unobstructed.				6.5.1 Install raceway covers.				
					6.5.2 Install cabling.	2.0	2 men		
	C. A device is required which will raise, vertically position, and suspend the cable assemblies during installation activities. The device must not subject any cable assembly to a bend radius less than five times the nominal diameter. Each cable assembly shall not be required to support more than its own weight.	Overhead Hoist			6.5.3 Install destruct system jumpers.	1.0	2 men		
					6.5.4 Install raceway covers.	1.75	2 men		
	D. Before and after attachment of the cable assemblies, the protective dust caps shall be removed and the connectors examined for contamination and bent or recessed pins. If moisture or foreign particles are found, the connector should be blown out and/or dried using 125 psi dry nitrogen. In the event that dust caps supplied by the vendor (plastic type only) are misplaced, plastic dust caps of the appropriate size, conforming to Specification NAS813, should be installed.	Compressed Nitrogen of 125 psig							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 6.0 Assemble and Checkout SRM Stage OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
6.5 (Continued)	e. A portable assembly stand is necessary at each access level to provide convenient working heights for personnel attaching cushioning pads, cable clamps, and securing grounding lugs. Cable attachment will require reach access from each platform floor level to the overhead of the above work platform, (approximately a 10-foot span per level). This stand shall be capable of supporting two men and be equipped with safety features, such as guard rails		Maintenance Platform Set:						
	f. Access shall be provided for personnel attaching cable assemblies to the raceway.	Personnel access							
	g. Access shall be provided for personnel to climb down into the nose section and mate connectors. Similarly, personnel must gain access into the aft support skirt region.		Platform and Ladder Maintenance Platform						
	H. Access shall be provided for raceway and destruct system jumpers to be installed.	Overhead Hoist	Maintenance Platform						
	I. A means is required to lift the raceway covers.	Overhead Hoist	Lifting Slings						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 6.0 Assemble and Checkout SRM Stage OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
6.6 Install Nose Cone	The nose cone assembly shall be raised from floor level to a position directly over the forward section. The fairing shall be lowered onto the forward section and temporarily attached with approximately four bolts. The fairing will be removed later for nose section entry to connect ordnance items. Consideration shall be given the following:				6.6 Install nose cone.				Assy Procedures
					6.6.1 Remove protective cover.	.5	3 men		
					6.6.2 Attach lifting sling to fairing.	.25	3 men		
					6.6.3 Position nose cone forward segment.	.25	3 men		
	A. A device is required to handle the nose cone assembly during lifting and installation operations. This device shall interface with facility overhead crane and attach directly to the nose cone.	Auxilliary Overhead Crane	Wire Rope Assy Leg Multiple		6.6.4 Attach nose cone forward segment.	1.0	2 men		
	B. Personnel access is necessary for attaching bolts for disconnecting the hoisting fixture from the nose cone.	Work Platform			6.6.5 Remove lifting sling.	.25	3 men		

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 6.0 Assemble and Checkout SRM Stage OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
6.7 Install Interstage Structures	After the rocket motor has been assembled, the interstage structure must be installed on the rocket motor.				6.7 Install Interstage Structure				Assy Procedures
	A. A means is required to lift the structural components into position for installation.	Overhead Hoist	Lifting Sling		6.7.1 Install aft interstage structure.	.5	3 men		
	B. Work space is required for workmen to direct the components into ppsition on the rocket motor and install attaching hardware.	Maintenance Platform			6.7.2 Install forward interstage structure.	.5	3 men		
					6.7.3 Align interstage structure.	1.0	3 men		
	C. A means is required to align the the attach points of the SRM/space shuttle interface for space shuttle attachment.	Maintenance Platform	Theodolite						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 6.0 ASSEMBLE AND CHECKOUT SRM STAGE OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
6.8 Perform Assembled SRM and Checkout Tests	After the rocket motor has been assembled and interstage structure installed, the assembled rocket motor tests and checkouts must be performed.				6.8 Perform assembled SRM checkout and tests.				Test Procedures
	A. Remove nozzle shipping links.	Overhead Hoist	Lifting Slings		6.8.1 Remove nozzle shipping links.	.5	3 men		
	B. Remove plugs from cabling and inspect connectors for bent pieces and/or foreign material.				6.8.2 Remove connector plugs and inspect connectors.	.5	1 man		
					6.8.3 Attach HPU test set.	.25	2 men		
	C. The HPU must be checked out and the nozzle actuated.		APU/Nozzle Test Set		6.8.4 Test HPU and nozzle actuator.	1.5	2 men		
					6.8.5 Remove HPU test set.	.25	2 men		
	D. An end-to-end continuity test must be performed across the electrical cabling.		Electrical Cable Test Set		6.8.6 Perform continuity tests.	1.0	2 men		
	E. The rocket motor must be pressurized and checked for leaks at joints.	Nitrogen Supply	R/M Leak Test Set		6.8.7 Perform pressure test.	1.5	3 men		
	F. The recovery system shall be verified. (details to be furnished later).		Recovery System Checkout Console		6.8.8 Verify recovery system	2.0	3 men		

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
7.0 Transport SRM Segments to VAB	The rocket motor buildup will take place at the VAB. Each segment will have to be transported from the Receive, Inspect Area or storage area to the VAB.								T&H Procedures

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 7.0 Transport SRM Segments to VAB OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
7.1 Prepare Segment for Transport	Prior to being placed on the transporter the segment must be prepared for shipment.				7.1 Prepare segment for transport.				
	A. The case roundness fixtures must remain in place.				7.1.1 Install nozzle shipping links and protective covers.	.5	3 men		
	B. The grain protective covers must be installed, if removed.		Sling		7.1.2 Inspect segment to ensure that the case roundness fixtures, the grain, protective covers and nozzle shipping links are installed properly.	.25	1 man		
	C. Install shipping links on nozzle.		Nozzle Shipping Links						
			Sling						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 7.0 Transport SRM Segments to VAB OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
7.2 Transfer Segment to Transport Medium	After the segment is prepared for transport it must be transferred from the storage chocks to the transporter.				7.2 Transfer segment to transport medium.				T&H Procedures
	A. A means is required to lift the segment from the storage chocks and place it on the transporter.	Overhead Gantry 200 Ton	Lifting Device		7.2.1 Position transporter next to segment.	.25	2 men		
					7.2.2 Install lifting device on segment.	.5	3 men		
	B. A means is required to handle the lifting device for assembly and disassembly to segment.	Overhead Gantry			7.2.3 Lift segment and position over trailer.	.25	3 men		
					7.2.4 Lower segment onto trailer.	.25	3 men		
					7.2.5 Remove lifting device.	.5	3 men		

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 7.0 Transport SRM Segments to VAB OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
7.3 Secure Segment for Transport	After the segment has been placed on the transporter it must be secured for shipment to the VAB.				7.3 Secure segment for transport.				
					7.3.1 Install tiedowns.	.5	2 men		
	A. A means is required to secure the segment to the transporter.		Support Chocks Tiedowns		7.3.2 Install case covers, if required.	1.0	3 men		
	B. The case protective covers must be installed if weather is bad.	Crane	Sling		7.3.3 Install grounding straps.	.25	1 man		
	C. A means is required to handle the support chocks and tiedowns if weight exceeds 75 pounds for each.	Crane	Sling						

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
7.4 Transport Segment to VAB	With the segment placed on the transporter and properly tied down and covered it must be transported to the VAB for assembly into the rocket motor.				7.4 Transport segment to VAB.				
					7.4.1 Transport segment.	.25	2 men		
	A. The segment must be grounded to prevent buildup of static electricity.		Grounding Straps						
	B. The segment must be protected against shock loads in accordance with the design specification.		Transporter						
	C. The segment must be protected against inclement weather during transportation.		Protective Covers						
	D. Maximum weight to be sustained by roadway will be 400,000 pounds.	Roadway between VAB and storage/ subassy building							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 7.0 Transport SRM Segments to VAB OR NOMENCLATURE AND NO. OF CEI			EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS		NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
7.5 Prepare Segment for Transfer	Upon arrival at the VAB the segment must be prepared for removal from the transporter and assembly into the rocket motor.					7.5 Prepare segment for transfer.				
	A. The tiedowns must be disconnected.					7.5.1 Disconnect tiedown.	.5	2 men		
	B. The protective covers must be removed.			Sling		7.5.2 Remove protective cover.	.75	3 men		
	C. Grounding strap must be disconnected.					7.5.3 Remove grounding strap.	.25	1 man		

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
7.6 Remove Segment from Transporter	After the diedowns have been disconnected and the protective cover removed, the segment must be removed from the transporter and prepared for assembly into the rocket motor.				7.6 Remove segment from transporter.				
					7.6.1 Install lifting device on segment.	.5	3 men		
	A. A means is required to lift the segment from the transporter.	Overhead Gantry 200 Ton Capacity	Lifting Device		7.6.2 Lift segment from transporter and position in support breakover stand.	.5	3 men		
	B. A means is required to support the segment while preparing it for assembly.		Support and Breakover Stand		7.6.3 Remove lifting device.	.5	3 men		
	C. A means is required to handle the lifting device for assembly and disassembly on segment.	Overhead Gantry							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
10.0 Receive, Inspect and Store Segments	Upon arrival at the assembly site each segment must be inspected for shipping damage and completeness of shipment. After inspection approval the segments must be transferred to a storage area until time to be subassembled. The rounding provisions included with the segments during shipping must remain on the segments until rocket motor assembly								

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
10.1 Remove Segment from Transporter	Each segment must be removed from the transporter.				10.1.1 Disconnect tiedowns from segment.	.25	2 men		T&H Manual (Kennedy)
	A. A means is required to lift the segment from the transporter.	Overhead Gantry 200 Ton Capacity	Lifting Device		10.1.2 Position lifting device over segment.	.25	3 men		
	B. A means is required to support the segment during inspection.		Lifting Sling Support Chocks		10.1.3 Lower lifting device and install on segment.	.25	3 men		
	C. A means is required to handle the lifting device during assembly and disassembly to the segment.	Overhead Gantry			10.1.4 Lift segment from trailer.	.25	3 men		
					10.1.5 Position segment on support chocks.	.25	3 men		
					10.1.6 Disconnect and remove lifting device.	.5	3 men		

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 10.0 RECEIVE, INSPECT AND STORE SEGMENT OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
10.2 Perform Receiving and Inspection Functions	A. Each segment must be inspected for obvious shipping damage and to ensure that the shipment received conforms to the bill of lading. B. Protective covers may have to be removed to complete the inspection. If required, remove these covers. If covers are removed they must be installed following inspection.	Lighting shall produce a minimum of 25 ft. candles at the working level	Sling		10.2 Perform receiving and inspection functions. 10.2.1 Inspect for shipping 10.2.2 Inspect for complete shipment. 10.2.3 Remove protective covers to enable inspection of suspect areas. 10.2.4 Install protective covers, if removed.	 .25/ seg.	 1 man 1 man		T&H Manual (Kennedy)

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 10.0 REMOVE, INSPECT AND STORE SEGMENTS OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
10.3 Transfer Segment to Subassembly or Storage Area	After receiving inspection has been performed the segment must be transferred to the sub-assembly or storage area as demand requires. The segment will be stored at the inspection site, within the RISS building.				10.3 Transfer segments to storage area or to sub-assembly area.	.25/seg.			T&H Manual (Kennedy)
	A. When stored within the receive, inspect building the segment may be stored at the inspection stand or transferred to another storage stand within the building. This will be done using the overhead gantry.	Overhead Gantry 200 Ton Capacity	Lifting Device						
	B. A means is required to transfer the segments to the subassembly area of the RISS building.	Overhead Gantry 200 Ton Capacity							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 10.0 RECEIVE, INSPECT AND STORE SEGMENTS OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
10.4 Store Segments	Storage space must be provided until time for shipment to the motor to the subassembly area.								
	A. The segments must be supported during storage.	Storage Chocks							
	B. The segments must be protected against inclement weather and foreign materials. Temperature condition will not be required.	Receive/Inspect Building (RISS)	Protective Covers						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.0 Receive, Inspect, Sub-assemble and Store Misc. Components	Misc. components will be manufactured at various sites. The components will be packaged and shipped to the assy site by the individual vendors. At the assy site the individual packages will be opened and the contents examined for shipping damage. If there is no damage the parts will be stored until time for assy. The following components are included, as applicable: 1. Aft Skirt Extension 2. Interstage Structure 3. Nose Cone 4. Staging Rockets 5. Safe and Arm Devices 6. Power Supply and Distribution System 7. Raceway Covers 8. Misc. Assembly Hardware 9. Recovery System 10. Destruct System	Receive, Inspect & Storage Space							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble, Store Misc. Components OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.1 Receive & Remove Aft Skirt Extension from Transporter	The aft skirt extension will be packaged and shipped by the vendor directly to the RISS bldg. At RISS building it must be inspected and removed from the transporter. A. Inspect the packaged aft skirt extension for evidence of shipping damage. B. The packaged aft skirt extension must be removed from the transporter. The container must provide for forklift handling		Forklift Truck		11.1 Receive and remove aft skirt extension from transporter				T&H Manual (Kennedy)

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassembly and Store Misc. Components ____ OR NOMENCLATURE AND NO. OF CEI ____		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.2 Remove Shipping Container & Inspect Aft Skirt Extension	The shipping container must be removed and the aft skirt extension must be inspected for shipping damage or other gross anomalies that could affect the fit or function of the skirt extension.	Receive & Inspection Space of 400 sq. ft. Lighting shall provide a minimum of 50 foot candles at the working level			11.2 Remove shipping container and inspect aft skirt extension.	.5	1 man		Insp Manual

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble & Store Misc. Components OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.3 Transport Aft Skirt Extension to Subassembly or Storage Area	After the aft skirt extension has been inspected it must be transferred to the subassembly or storage area as demand requires.		Forklift Truck		11.3 Transport aft skirt extension to storage or subassembly area.	.5	1 man		T&H Manual (Kennedy)

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.4 Store Aft Skirt Extension	A storage place is required for the aft skirt extension to be stored until required for subassembly.	Storage Area 400 sq. ft. for two skirt extensions Two Level Storage Racks							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble and Store Misc. Components ______ OR NOMENCLATURE AND NO. OF CEI ________		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.5 Receive & Remove Ordnance Items from Transporter	A. The ordnance items will be packaged and shipped by the individual vendors directly to the RISS building. At the RISS building each ordnance item must be removed from the transporter and placed in storage until it can be inspected. The packaged ordnance items are generally small enough to be handled without special lifting equipment or palletized for forklift handling. B. Inspect packaged ordnance items for evidence of in shipment damage. Ordnance items include: 1. Safe and Arm Devices 2. Staging Rockets 3. Destruct System		Forklift Truck Wood Pallets		11.5 Receive and remove ordnance items from transporter.				T&H Manual (Kennedy)

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble and Store Misc. Components ____ OR NOMENCLATURE AND NO. OF CEI ____		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.6 Remove Shipping Container & Inspect Ordnance Items	Each shipping container must be opened and the ordnance item inspected for damage.	Lighting shall provide a minimum of 50 foot candles at the working level			11.6 Remove shipping containers and inspect ordnance items.				Insp. Manual

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble and Store Misc. Components OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
11.7 Transport Ordnance Items to Storage or Subassembly Area	After the ordnance items have been inspected, they must be transferred to a storage or subassembly area. The items shall be palletized for transportation and storage. Those items to be transported to the subassembly area immediately are: 1. Staging Rockets 2. Destruct System Those items to be stored are: 1. Safe and Arm Devices		Wood Pallets Forklift Truck		11.7 Transport ordnance items to storage or subassembly area.				T&H Manual (Kennedy)

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.8 Store Ordnance Items	A storage place is required for the ordnance items until required for rocket motor buildup.	Storage Area of 100 sq. ft. Storage Rack							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble & Store Misc. Components OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
11.9 Receive & Remove Interstage Structure from Transporter	The interstage structures will be packaged and shipped by the vendor directly to the RISS Building. At the RISS building the support structure must be removed from the transporter and inspected. A. The packaged support structure must be removed from the transporter. Packaging must permit forklift handling. B. The packaged support structure shall be inspected for evidence of shipping damage.		Forklift Truck		11.9 Receive and remove support structure from transporter.				T&H Manual (Kennedy)

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.9 Receive & Remove Interstage Structure from Transporter	The interstage structures will be packaged and shipped by the vendor directly to the assy site. At the assy site the support structure must be removed from the transporter and inspected. A. The packaged support structure must be removed from the transporter. Packaging must permit forklift handling. B. The packaged support structure shall be inspected for evidence of shipping damage.		Forklift Truck		11.9 Receive and remove support structure from transporter.				T&H Manual (Kennedy)

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble and Store Misc. Components ______ OR NOMENCLATURE AND NO. OF CEI ______		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.10 Remove Shipping Container & Inspect Interstage Structure	The shipping container must be removed and the interstage structure inspected for shipping damage or other gross anomalies that could affect the fit or function of the structure.	Lighting shall provide a minimum of 50 foot candles at the working level			11.10 Remove shipping container and inspect support structure.				Insp. Instructions Manual

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble and Store Misc. Components ________ OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.11 Transport Interstage Structure to Storage Area	After the interstage structure has been inspected it must be transferred to a storage area. if not needed at the VAB.		Forklift Truck		11.11 Transport support structure to storage area.				T&H Manual (Kennedy)

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble and Store Misc. Components ____ OR NOMENCLATURE AND NO. OF CEI ____		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.12 Store Interstage Structure	A storage place is required for interstage structure to be stored until required for rocket motor buildup.	Storage Area 100 sq. ft. required/structure Storage Racks							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble & Store Misc. Components OR NOMENCLATURE AND NO. OF CEI			EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS		NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.13 Receive & Remove Misc. Components from Transporter	Each misc. component will be packaged and shipped directly to the RISS Building by the vendor or TCC. At the RISS Building the components must be removed from the transporter and inspected. A. A means is required to lift these components from the transporter. B. The packaged components shall be inspected for evidence of shipping damage. The misc. components include: 1. Power Supply and Distribution System 2. Misc. Assembly Hardware 3. Raceway Covers 4. Recovery System	Overhead Hoist		Lifting Slings Forklift Truck Pallet		11.13 Receive and remove misc. components from transporter.				T&H Manual (Kennedy)

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble & Store Misc. Components ______ OR NOMENCLATURE AND NO. OF CEI ______		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.14 Remove Shipping Container & Inspect Misc. Components	The shipping container must be removed from each component and the component inspected for shipping damage or other anomalies that could affect the fit or function of the component.	Inspection Space 100 sq. ft. Lighting shall provide a minimum of 50 foot candles at the working level			11.14 Remove shipping container and inspect misc. components.				Insp. Manual

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.15 Transport Misc Components to Subassembly or Storage Area	After inspection each component must be transported to the subassembly or storage area. A. A means is required to transport the components. Those components to be transported to the storage area include: 1. Part of Power Supply and Distribution System (Battery Set & Cabling) 2. Raceway Covers 3. Misc. Assembly Hardware Those components to be transported to the subassembly area include: 1. Recovery System 2. Part of Power Supply and Distribution System (Black Boxes & Associated Cabling)	Overhead Hoist	Forklift Truck Pallet		11.15 Transport misc. components to subassembly or storage area.				T&H Manual (Kennedy)

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.16 Store Misc. Components	A storage space is required for all components until they are required for rocket motor buildup.	Storage Space 50 sq. ft. Storage Rack							

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble & Store Misc. Components ____ OR NOMENCLATURE AND NO. OF CEI ____		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.17 Charge & Test Battery Set	The battery set must be fully charged and tested no sooner than two hours prior to being transported to the VAB where it will be installed in the rocket motor. A. A means is required to charge the battery set and test it to ensure that it is fully charged and is retaining its charge.	Facility Power	Battery Test Set		11.17 Charge and test battery set.				Operation Instruction

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.18 Install Staging Rockets in Aft Skirt Extension	The staging rockets must be installed in the aft skirt extension. A. A means is required to handle the staging rockets. B. A means is required to support the aft skirt extension and provide access to attach points	Overhead Hoist 10 Ton Capacity	Lifting Device Staging Rockets Support Stand Work Platform		11.18 Install staging rockets in aft skirt extension. 11.18.1 Install staging rockets in aft skirt extension.	4.0	3 men		Assy Procedures

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.19 Receive & Remove Nose Cone from Transporter	The nose cone will be placed in a shipping container and shipped directly from the vendor to the RISS Building. At the RISS building it must be removed from the transporter and inspected. A. The nose cone must be removed from the transporter. B. The nose cone (packaged) shall be inspected for evidence of shipping damage	Overhead Hoist 10 Ton Capacity	Lifting Slings		11.19 Receive and remove nose cone from transporter.				T&H Manual (Kennedy)

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 11.0 Receive, Inspect, Subassemble & Store Misc. Components OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.20 Remove Shipping Container and Inspect Nose Cone	The shipping container must be removed and the nose cone inspected for shipping damage or other gross anomalies that could affect the fit or function of the nose cone. A. A means is required to lift the container cover from the nose cone.	Lighting shall provide a minimum of 50 foot candles at the working level Overhead Hoist 400 sq. ft. floor space	Lifting Slings		11.20 Remove shipping container and inspect nose cone.				Insp. Rqmt. Manual

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.21 Transport Nose Cone to Subassy or Storage Area	After the nose cone has been inspected it must be transported to the subassembly or storage area as needed.	Overhead Gantry 10 Ton Capacity	Lifting Sling		11.21 Transport nose cone to storage or sub-assembly area.				T&H Manual (Kennedy)

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.22 Install Staging Rockets & Misc Components in Nose Cone	Staging rockets, misc. components of the power supply and distribution system with associated cabling must be installed in the nose cone prior to rocket motor buildup.				11.22 Install staging rockets and misc. components in nose fairing.				Operations Manual
	A. A means is required to support and lift the staging rockets into position.	Overhead Hoist 10 Ton Capacity	Lifting Device, Staging Rockets		11.22.1 Lift staging rocket into position.	.25			
	B. A means is required to support the nose cone and provide access to attach points in the nose cone.		Support Stand Work Platform		11.22.2 Install staging rockets.	3.75			
	C. Access must be provided for personnel to reach the work points on the nose cone.		Work Platform		11.22.3 Install misc. "black boxes" in fairing.	4.0			
	D. Misc. "black boxes" and associated cabling shall be installed in the nose cone.	Overhead Hoist	Work Platform						

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.23 Store Nose Cone Subassy	After the components and staging rockets have been installed on the nose cone, the subassembly must be stored until time for rocket motor buildup. A. Storage space is required for the nose cone subassembly.	 Storage Space 400 sq. ft. /Subassy							

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.24 Store Aft Skirt Extension Subassembly	A requirement exists to store the aft skirt extension subassembly prior to transportation to the VAB whenever the subassembly is not needed at the VAB.	Storage Area 400 sq ft for two Subassemblies							

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.25 Transport Aft Skirt Extension to Subassembly Area	A requirement exists to transport the aft skirt extension to the subassembly area following storage. The requirements for this function are identical to those of Function 11. 3.	See 11.3	See 11.3		11.25 Transport aft skirt extension to subassembly area. See Function 11. 3		See 11.3		See 11.3

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
11.26 Store Nose Cone	A requirement exists to store the nose cone when not needed at the subassembly area.	Storage Space of 400 sq ft per Subassembly							

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.27 Transport Nose Cone to Subassembly Area	After storage the nose cone must be transported to the subassembly area. The requirement of this function is identical to Function 11.21.	See 11.21	See 11.21		See 11.21				

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
11.28 Install Recovery System In Aft Skirt Extension	The recovery system shall be installed in the aft skirt extension prior to installation of staging rockets.		Common Hand Tools		11.28 Install recovery subsystem in aft skirt extension.				Operations Manual
	A. A means is required to handle the recovery system during installation.	Overhead Crane	Lifting Slings		11.28.1 Install recovery system.	3.0	3 men		
	B. Access shall be provided for assembly		Work Platform						

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.29 Fabricate "O" Ring for SRM Assemble	A requirement exists to fabricate "O" rings for SRM assemble		"O" Ring Fabrication Tool		11.29 Fabricate "O" ring for SRM assembly. 11.29.1 Fabricate "O" ring.	 24.0			Operations Manual

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING	TRAINING EQUIP. REQ	
11.30 Transport Nose Cone Subassembly to Storage	The nose cone subassembly must be transported to storage when not needed at the VAB. The requirements of this function are identical to Function 11.21.	See 11.21	See 11.21		See 11.21					

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
11.31 Transport Ordnance Items to Subassembly Area	After storage a requirement exists to transport the following components to the subassembly area: 1. Staging Motors 2. Destruct System Components The requirements for this function are identical to Function 11.7 as applicable to these components.	See 11.7	See 11.7		See 11.7	See	11.7		See 11.7

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
12.0 Transport SRM Segments TO RISS Building	The SRM segments must be transported from the factory to the assembly site in quantities that will satisfy the launch rate. The segments will be assembled into shipping configurations for transport to the assembly site. The shipping configurations must be delivered to their destination without having been subjected to detrimental or damaging influences and resulting loss of reliability. Means must be such as to maintain flight readiness of the items during the transport function. The preservation and packaging of the segments for their protection during handling, shipment, and storage shall be in accordance with TBD Identification and marking of the segments, shall be in accordance with the requirements of TBD Upon arrival at the assembly site, the segment shipping configurations must be unloaded at the RISS Building.								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 12.0 Transport SRM segments to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
12.1 Transport Segment to Railhead	The segments must be transported from the TCC manufacturing area to the railhead. These segments will be prepared for shipment and placed on the transporter by manufacturing personnel. The following are required to transport each segment:				12.1 Transport segment to railhead.				T&H Manual
					12.1.1 Transport segment to railhead.	2.0	2 men		
	A. A transport medium with the following capabilities: 1. Capacity to support a load of 400,000 pounds. 2. Tiedown provisions. 3. Mitigation of shock loads within the limits specified in the design specification. 4. Axle load limitation due to local requirements shall be considered in the design of the transport medium.		Trailer Truck Tractor Tiedown						
	B. Protection shall be provided against inclement weather and exposure of the propellant grain to open air. Temperature control will not be required.		Protective Cover						
	C. Each segment shall be supported in a horizontal attitude.		Protective Cover Tiedowns & Support Chocks						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 12.0 Transport SRM Segments to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
12.2 Transfer Segments To Railcar	Upon arrival at the railhead, the segment must be transferred from the transporter to the railcar.				12.2 Transfer segments to railcar.				T & H Manual
	A. Provisions must be made to transfer the segment from the transporter to the railcar.				12.2.1 Remove protective cover.	.5	3 men		
					12.2.2 Install lifting device.	.5	3 men		
	1. The segment must be lifted and transferred to the railcar.	Overhead Gantry 200 Ton Cap	Lifting Device		12.2.3 Lift segment to railcar.	.5	3 men		
	B. The protective cover must be removed before the lifting device can be installed.	Overhead Hoist	Sling		12.2.4 Remove lifting device.	.5	3 men		

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 12.0 Transport SRM Segments to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
12.3 Prepare Segments for Transportation	A. The segment must be secured to the rail-car for shipment. The securing device shall support the segments against longi-tudinal, lateral and vertical loads of		Tiedowns		12.3.1 Attach sling to tie-down.	.25	1 man		T&H Manual
					12.3.2 Raise tiedown into position over attach point on railcar.	.5	2 men		
	B. The tiedowns shall be lifted into position and placed on the railcar preparatory to installation.	Overhead Hoist	Lifting Sling		12.3.3 Remove sling and attach tiedown to railcar.	.5	2 men		
	C. The segments shall be grounded		Grounding Straps		12.3.4 Attach tiedown to segment.	.5	2 men		
					12.3.5 Attach grounding straps.	.25	1 man		

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 12.0 Transport SRM Segments to RISS Building OR NOMENCLATURE AND NO. OF CEI			EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS		NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
12.4 Transport SRM Segments to Assembly Site	The SRM segments must be transported from the railhead at Corinne, Utah, to the assembly site.					12.4 Transport SRM segments to assembly site.	14 days			T&H Manual
	A. Each segment shall be transported on a separate railcar.			Railcar						
	1. The railcar shall have a minimum load capacity of 400,000 pounds.									
	2. Each railcar shall have hard points to interface with the support structure of the segment.									
	3. The railcars shall have provisions for shock mitigation.									
	B. Each segment shall be grounded during shipment.			Grounding Straps						
	C. Each segment must be configured, including transportation equipment, to permit railrod clearance to the assembly site.									

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 12.0 Transport SRM Segments to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
12.5 Prepare Segments for Transfer	Upon arrival at the RISS Building, the segments must be prepared for transfer from the railcar				12.5 Prepare segment for transfer.				T&H Manual
	A. The segments must have the tiedown removed.	Overhead Crane			12.5.1 Remove tiedowns.	.5	2 men		
	B. The grounding straps must be removed.				12.5.2 Remove grounding straps.	.25	1 man		

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REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 12.0 Transport SRM Segments to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
12.6 Transfer Segments to Receive, Inspect Area	Each segment must be transferred from the railcar to the receive, inspect area. A. Provisions must be made to transter the segment from the railcar to the receive, inspect area. 1. The segment must be lifted and transferred to the receive, inspect area.	Overhead Gantry 200 Ton Capacity	Lifting Device		12.6 Transfer segments to transporter. 12.6.1 Remove protective covers. 12.6.2 Install lifting device. 12.6.3 Lift segment from railcar to support chocks. 12.6.4 Remove lifting device.	 .5 .5 .5 .5	 3 men 3 men 3 men 3 men		T&H Manual

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
13.0 Transport Misc. Components to RISS Bldg.	The components must be transported from the factory to the RISS bldg in quantities that will satisfy the launch rate. The end items will be assembled and/or dis-assembled into shipping configurations for transport to assy site. The shipping configurations must be delivered to their destination without having been subjected to detrimental or damaging influences and resulting loss of reliability. Means must be such as to maintain flight readiness of the items during the transport function. The preservation and packaging of the components for their protection during handling, shipment, and storage shall be in accordance with TBD. Identification and marking of the components shall be in accordance with the requirements of TBD. Upon arrival at the assy site, the components must be unloaded at the RISS building. The misc. components include: See RAS 11.0.								

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REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI			EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS		NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
13.0 Transport Misc. Components to RISS Bldg. (Continued)	The components must be preserved, packaged, and packed prior to transport for protection against physical and operational degradation resulting from the following transportation and handling environments. A. Temperature ranging from -35°F to +160°F B. Altitude to 6,000 feet during shipment C. Relative humidity up to 100% The protection process used shall be the minimum required for adequate protection under the conditions of normal handling, shipment, and storage in accordance with Components, in excess of 45 pounds must have provisions for two-man lift where the lifting height is not in excess of 5 feet and where the total weight is not in excess of 90 pounds. Solid motor components weighing over 90 pounds, should have provisions for mechanical or power lift.									

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 13.0 Transport Misc. Components to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
13.1 Transport Aft Skirt Extension to RISS Bldg.	The aft skirt extension shall be packaged for shipment by the vendor. Shipment will be made via common carrier directly from the vendor to the RISS building.								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 13.0 Transport Misc. Components to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
13.2 Transport Interstage Structure to RISS Bldg.	The interstage structure will be packaged for shipment by the vendor. Shipment will be made via common carrier directly from the vendor to the RISS building.								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 13.0 Transport Misc. Components to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
13.3 Transport Ordnance Items to RISS Bldg.	All ordnance items will be packed in accordance with appropriate packing specification by the vendor. The items will then be shipped to the RISS building.		Shipping Container S&A Devices Shipping Container Staging Rocket						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 13.0 Transport Misc. Components to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
13.4 Transport Misc. Components to RISS Bldg.	Misc. components will be packaged by TCC or vendor and shipped directly to the RISS building via common carrier. These components included are: See RAS 11.13								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 13.0 Transport Misc. Components to RISS Building OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
13.5 Transport Nose Cone To RISS Building	The nose cone shall be packaged for shipment by the vendor. Shipment will be made via common carrier directly from the vendor to the RISS Building at KSC.								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
22.0 Recover SRM Hardware	Recovery of SRM begins immediately following splashdown and ends with disposal or arrival of SRM hardware at TCC, hardware vendor or site refurbishment areas as applicable.								

REQUIREMENTS ALLOCATION SHEET

FUNCTIONAL DIAGRAM TITLE AND NO. 22.0
RECOVER SRM HARDWARE OR
NOMENCLATURE AND NO. OF CEI

FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	EQUIPMENT IDENTIFICATION: NOMENCLATURE	EQUIPMENT IDENTIFICATION: CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS: TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
22.1 Recover SRM Hardware	After the SRM is on the recovery ship the following functions must be performed:				22.1 Recover SRM hardware.				Recovery Procedures
	A. Inspect all safe and arm devices in the TT system and destruct systems to ensure they are in the safe position.				22.1.1 Inspect S&A devices for safe condition.	.25	1 man		
	B. Hose down and flush all external hardware on the SRM with fresh water.	Fresh Water Supply Tanks with Pump 10 to 15000 Gallon Capacity			22.1.2 Hose external hardware.	1.0	2 men		
					22.1.3 Remove HPU.	2.0	2 men		
	C. Remove HPU unit from SRM. HPU unit weight is	Crane	Lifting Slings		22.1.4 Flush HPU.	1.0	2 men		
					22.1.5 Run turbine.	2.0	2 men		
	D. Flush HPU with fresh water.	Fresh Water Supply			22.1.6 Preserve all exposed metal surfaces.	1.0	1 man		
	E. Run turbine with an atomized nitrogen-oil mixture.	N_2 Supply & Hoses	Oil per Spec TBD						
	F. Spray all exposed metal surfaces with a preservative	Compressor & Sprayer	Oxidation Inhibitor Spec TBD						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 RECOVER SRM HARDWARE OR NOMENCLATURE AND NO. OF CEI

FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	EQUIPMENT IDENTIFICATION: NOMENCLATURE	EQUIPMENT IDENTIFICATION: CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS: TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
22.3 Disassemble SRM Hardware	After splashdown the expended rocket motors will be recovered and transported to the dock. At the dock, each motor will be off-loaded from the ship and placed in a chock. At this point the rocket motor will be disassembled and the various components disposed of or transported to the inspection area. The rocket motor will be disassembled into the following components:		Support Chocks		22.3 Disassemble SRM hardware.		4 men/ SRM		Disassy Procedures
					22.3.1 Remove aft skirt extension subassembly	3.0/ SRM			
					22.3.2 Remove raceway covers and electrical cables.	4.0/ SRM			
	1. Segment cases 2. Segment attach hardware 3. Nozzle 4. Nose cone subassembly 5. Interstage attach hardware 6. Aft skirt extension subassembly 7. Electrical cabling 8. Raceway covers 9. HPU				22.3.3 Remove nozzle.	3.0/ SRM			
					22.3.4 Remove interstage structure.	4.0/ SRM			
					22.3.5 Remove aft segment.	3.0/ SRM			
	A. There is a requirement for disassembly and handling the case segments. The segment weights are as follows: Forward Segment: 17,000 lbs. Center Segment: 20,000 lbs. Aft Segment: 20,000 lbs.	Crane 15 Ton Capacity	Lifting Device Pin Removal Tool		22.3.6 Remove nose cone subassembly.	3.0/ SRM			
					22.3.7 Remove forward segment.	3.0/ SRM			
					22.3.8 Remove center segment.	3.0/ SRM			

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 RECOVER SRM HARDWARE OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
22.3 Disassemble SRM Hardware (Continued)	B. A means is required to remove and handle the nozzle. Weight: 1300 lbs.	Crane 1 Ton Capacity	Lifting Device, Nozzle						
	C. A means is required to disassemble and handle the aft skirt extension subassy. Weight:	Crane	Lifting Slings						
	D. A means is required to handle nose cone. Weight:	Crane	Lifting Slings						
	E. A means is required to handle inter-stage attach hardware. Weight:	Crane	Lifting Slings						
	F. A means is required to handle the other misc. components.								
	All exposed metal surfaces shall be sprayed with a preservative	Spray Equipment	Oxidation Inhibitor						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 RECOVER SRM HARDWARE OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
22.4 Transport SRM Hardware to Inspection Area	After disassembly the following components must be transported to the receiving, inspection area for further processing:				22.4 Transport SRM hardware to inspection area.		2 men/ SRM		Disassy Procedures
	1. Segment cases 2. Segment attach hardware				22.4.1 Load, transport & unload aft skirt extension.	2.0 ea			
	3. Nozzle 4. Nose cone subassembly 5. Interstage structure				22.4.2 Load, transport & unload cabling.	.5			
	6. Aft skirt extention subassembly 7. Electrical cabling 8. HPU 9. Raceway covers				22.4.3 Load, transport & unload attach hardware & raceway covers.	.5 ea			
	10. Recovery system components (recovery system components to be shipped to vendor facility at site)				22.4.4 Load, transport & unload nozzle.	2.0 ea			
	A. A means is required to handle the components for loading onto the transporter. Weights are as follows:	Crane 15 Ton Capacity	Lifting Slings Lifting Device, Case Nozzle Lifting Device		22.4.5 Load, transport & unload interstage structure.	2.0 ea			
					22.4.6 Load, transport & unload aft segment.	2.0 ea			
	Case Segments: 20,000 lbs. Nozzle: 1,300 lbs. Segment Attach Hardware:				22.4.7 Load, transport & unload nose cone.	2.0 ea			
	Nose Cone: Interstage Hardware: Aft Skirt Extension:				22.4.8 Load, transport & unload forward segment.	2.0 ea			
	Electrical Cabling: Raceway Covers: HPU:				22.4.9 Load, transport & unload center segments.	2.0 ea			
	B. A means is required to transport the cases.		Transporter Truck Tractor		22.4.10 Load, transport & unload HPU.	.5			
	1. Segment case weights are shown above.								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 Recover SRM Hardware OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
22.4 Transport SRM Hardware to Inspection Area (Continued)	2. Each case must be supported on the transporter.		Chocks						
	3. The case must be secured during transportation.		Tiedowns						
	C. A means is required to transport the aft skirt extension.		Semi-trailer Truck Tractor Tiedowns						
	D. A means is required to transport the nose fairing, nozzle and HPU, attach hardware, electrical cabling and raceway covers.		Semi-Trailer Truck Tractor Tiedowns						
	E. A means is required for unloading of the above components at the inspection site.	Crane, Capacity 15 Ton	Lifting Slings Lifting Device, Case Lifting Device Nozzle						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 RECOVER SRM HARDWARE OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
22.5 Disassemble & Inspect SRM Segments, Interstage Structure & Cabling	The following hardware must be inspected for suitability to be refurbished and reused in new SRM's. 1. Case Segments 2. Interstage Attach Hardware 3. Electrical Cabling 4. Raceway Covers 5. Misc. Attach Hardware 6. Black Boxes 7. Unused S&A Devices A. The components will be examined for evidence of structural failure, burn through and other physical damage that would negate its reuse. B. Access must be provided for inspection. C. Electrical cabling shall be checked for corrosion, frayed areas, damaged connectors and electrical continuity.	Floor Space 8000 sq. ft.	Inspection Equipment Work Platform Test Set, Electrical Cable		22.5 Disassemble and inspect SRM hardware. 22.5.1 Disassemble destruct system components, if required. 22.5.2 Inspect case segments. 22.5.3 Inspect interstage hardware. 22.5.4 Inspect misc. attach hardware. 22.5.5 Inspect electrical cabling.	 1.0 ea 4.0 ea 4.0 ea 4.0 ea 2.0 ea	2 men/ SRM		Inspect Procedures

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 RECOVER SRM HARDWARE OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
22.6 Dispose of Expendable Hardware	After removal from the rocket motor the following hardware must be disposed of: 1. Expended Ordnance Items 2. Raceway Covers 3. Expendable Nozzle Components 4. Expendable Recovery System Components				22.6 Dispose of expendable hardware.				Disposal Procedures

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 Recover SRM Hardware OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
22.7 Disassemble Nozzle and Inspect	A requirement exists to disassemble the nozzle into the following components:				22.7 Disassemble nozzle and inspect.				Disassemble and Insp Procedure
	1. Flex bearing 2. Metal parts 3. Expendable components				22.7.1 Remove flex bearing	1.0	2 men		
					22.7.2 Remove expendable items from metal parts.	12.0	2 men		
	A. A means is required to handle the nozzle during disassembly	Fork Lift Overhead Crane	Pallets Lifting Slings		22.7.3 Inspect metal components.	2.0	2 men		
	B. A means is required to remove expendable components from metal parts.	Oven Overhead Crane	Hand Tools, Common Lifting Slings		22.7.4 Inspect flex bearing.	1.0	2 men		
	C. A means is required to remove the flex bearing.	Overhead Crane	Lifting Slings Common Hand Tools						
	D. A means is required to cleanup the flex bearing and the metal parts for inspection.		Trichloroethane Clean Cloth						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 Remove SRM Hardware OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
22.7 Disassemble Nozzle and Inspect (Continued)	E. The metal parts shall be inspected for the following: 1. Obvious damage 2. Critical dimensions	Minimum lighting of 100 ft candles at working level	Common Inspection Equipment						
	F. The flex bearing shall be inspected for damage to metal parts.	Minimum lighting of 60 ft candles at working level							
	G. Access for disassembly and inspection shall be provided.		Work Platform						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 RECOVER SRM HARDWARE OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
22.8 Disassemble Nose Cone Subassembly and Inspect	A requirement exists to disassemble the nose cone subassembly into the following components: 1. Nose cone components 2. Black boxes 3. Expended ordnance items 4. Live S&A devices	Common Hand Tools			22.8 Disassemble nose cone subassembly and inspect.				Disassy & Inspect Procedures
					22.8.1 Disassemble nose cone components.	.5	3 men		
					22.8.2 Disassemble S&A device.	.5	2 men		
	A. A means is required to handle the various components during disassembly and inspection.	Fork Lift Overhead Crane	Pallets Lifting Slings		22.8.3 Disassemble black boxes.	1.5	2 men		
	B. A means is required to electrically check the black boxes for reuse or refurbishment.		Electrical System Check-out Console		22.8.4 Disassemble expendable ordnance.	1.0	3 men		
					22.8.5 Inspect structural members.	1.0	2 men		
	C. A means is required to checkout unused S&A devices for reuse.		Ordnance Test Set		22.8.6 Inspect black boxes and checkout.	2.0	2 men		
	D. The structural components shall be inspected for damage and critical dimensions checked.	Minimum lighting 100 ft candles at working level	Common Inspection Equipment		22.8.7 Inspect unused S&A devices.	1.0	2 men		
	E. The electrical connectors and exterior surface of the black boxes and S&A devices shall be inspected for damage.	60 ft candles minimum lighting							
	F. The interior of the black boxes shall be inspected for sea water infiltration.	60 ft candles minimum lighting	Common Hand Tools						
	G. Access shall be provided for disassembly and inspection.		Work Platform						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 Recover SRM Hardware OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
22.9 Disassemble Aft Skirt Extension Subassembly and Inspect	A requirement exists to disassemble the aft skirt subassembly into the following components: 1. Aft skirt extension components 2. Recovery system components 3. Expended ordnance items		Common Hand Tools		22.9 Disassemble aft skirt extension subassembly and inspect.				Disassy & Insp Procedures
					22.9.1 Disassemble expended ordnance item.	1.0	3 men		
					22.9.2 Remove recovery system components.	3.0	3 men		
	A. A means is required to handle the various components during disassembly and inspection.	Fork Lift Overhead Crane	Pallets Lifting Slings		22.9.3 Disassemble aft skirt extension.	2.0	3 men		
	B. The structural components shall be inspected for damage and critical dimensions checked.	100 ft. candles minimum lighting	Common Inspection Equipment.						
	C. Recovery system components shall be inspected for gross damage. NOTE: Final inspection of recovery system components to be done at vendor facilities.	60 ft candles minimum lighting							
	D. Access shall be provided for disassembly and inspection.		Work Platform						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 22.0 Recover SRM Hardware OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
22.10 Disassemble APU and Inspect	The APU shall be disassembled into its various subassemblies and components.		Common Hand Tools		22.10 Disassemble APU and inspect.				Disassy & Inspect Procedures
	A. A means for handling the APU and its associated components shall be provided.	Fork Lift Overhead Crane	Pallets Lifting Slings		22.10.1 Disassemble APU.	3.0	3 men		
					22.10.2 Inspect APU.	5.0	2 men		
	B. The components shall be inspected for corrosion, damage and critical dimensions checked.	100 ft candles minimum lighting	Common Inspection Equipment						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
23.0 Transport SRM Hardware to TCC or Vendor	If inspection indicates that the following components can be reused they will be shipped to TCC for refurbishment. 1. Case Segments 2. Nozzle Flex Bearing				23.0 Transport SRM hardware to TCC or vendor.				Shipment Inst.
					23.0.1 Package components for shipment to vendor.	9.0	1 man		
	A. A means is required for loading the components onto the transporter.	Crane 15 Ton Capacity	Lifting Slings		23.0.2 Prepare segments and nozzle bearing for shipment to TCC.	8.0/SRM	2 men		
	B. A means is required to support the case segments during shipment.		Rail Chocks Tiedowns End Stiffeners						
	C. A means is required to support and protect the nozzle bearing during shipment.	Packaging & Shipping Area & Associated Equipment	Shipping Crates						
	If inspection indicates that the following components can be reused they will be shipped to the vendor for refurbishment and reuse: 1. HPU 2. Black Boxes (if found to be in need of refurbishment thru inspection) 3. Recovery System (vendor facility at KSC) 4. Nozzle Metal Parts								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
23.0 Transport SRM Hardware to TCC or Vendor (Continued)	A. A means is required to package the black boxes and HPU component parts for shipment to the vendor. (approximately 10 containers/SRM).	Packaging & Shipping Area and Equipment	Shipping Crates						
	B. A means is required to handle the packaged components and the recovery system.		Fork Lift, Truck						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
24.0 Refurbish at Site	If inspection indicates the following components can be reused, they will be cleaned and repaired for reuse. 1. Aft Skirt Extension Weight: 2. Interstage Structure Weight: 3. Attaching Hardware 4. Nose Cone Weight 5. Black Boxes 6. Cabling	Floor Space 1000 sq. ft.			24.0 Refurbish. 24.1 Clean components. 24.2 Repair components. 24.3 Paint components.	 2.0/ SRM 8.0/ SRM 2.0/ SRM	 2 men 2 men 1 man		Refurbish Inst.
	A. A means is required for lifting and handling of these components during refurbishment.	Crane,	Lifting Slings						
	B. A means is required to wash down, clean, deburr and paint components	Paint Sprayer Degreaser, Grit Blast Equipment	Trichloroethane Hand Tools						
	C. Repairs to be accomplished include: 1. Minor straightening of bent parts. 2. Repairs using spares provided. 3. Replacement of fasteners.								
	D. Remove and replace cabling and black box damaged connectors.		Common Hand Tools						

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
25.0 Reject SRM Hardware and Dispose	If inspection, indicates that the following components are not suitable for reuse, they will be disposed of: 1. Structural Members 2. Nozzle Components 3. Electrical Cabling 4. HPU Components 5. Black Boxes 6. S&A Units not used 6. Destruct System Components 7. Recovery System Components								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
27.0 Abort	Upon command from the space shuttle pilot and/or the ground safety officer, the space shuttle system mission shall be aborted. This decision shall be based on evaluation of data received relative to flight trajectory, shuttle system functions monitoring, SRM functions monitoring and inadvertent separation. The possible abort sequence to be followed for any combination of malfunctions is as follows: A. Space shuttle under full thrust, one SRM does not ignite. Choices available: 1. Restrain space shuttle system on launch pad and allow ignited SRM to burnout, shutdown space shuttle engine. 2. Restrain space shuttle system on launch pad, shutdown space shuttle engines, allow ignited SRM to burnout. 3. Restrain space shuttle system on launch pad, separate space shuttle from SRM stage and when space shuttle is free, thrust terminate SRM and allow it to burnout.								

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
27.0 Abort (Continued)	4. Restrain space shuttle system on launch pad, shutdown space shuttle engines, terminate SRM thrust. 5. Restrain space shuttle system on launch pad, terminate SRM thrust, shutdown space shuttle engines. B. Space shuttle under full thrust, SRM stage ignites, space shuttle malfunctions before release of vehicle. Choices available: 1. Restrain space shuttle system on launch pad and allow SRM stage to burnout. 2. Restrain space shuttle system on launch pad and correct space shuttle malfunction, release space shuttle system to fly away. 3. Release space shuttle system, gain required altitude and terminate SRM thrust simultaneous with space shuttle release for "dead stick" return to earth.								

REQUIREMENTS ALLOCATION SHEET

FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR

NOMENCLATURE AND NO. OF CEI

FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	EQUIPMENT IDENTIFICATION: NOMENCLATURE	EQUIPMENT IDENTIFICATION: CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS: TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
27.0 Abort (Continued)	4. Restrain space shuttle system on launch pad, thrust terminate SRM stage and permit the SRM stage to burnout. C. Vehicle lifts off and the space shuttle malfunctions. Choices available: 1. Allow vehicle to leave critical area and reach required altitude. Thrust terminate SRM stage at same time space shuttle is released for "dead stick" return to earth. D. Vehicle lifts off and there is a SRM malfunction. Choices available: 1. If sufficient thrust exists, allow vehicle to leave critical area, thrust terminate SRM stage, separate space shuttle from SRM stage and fly space shuttle to earth. 2. If sufficient thrust does not remain to move vehicle from critical area, thrust terminate SRM stage, simultaneously separate space shuttle and fly away. This will cause the SRM stage to fall in a critical area.								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. TOP OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
27.0 Abort (Continued)	E. Inadvertent separation in space shuttle. Choices available: 1. Fly orbiter away and thrust terminate SRM stage. F. Inadvertent separation of SRM. Choices available: 1. Thrust terminate separated SRM, thrust terminate remaining SRM simultaneously with orbiter release for return to earth. Studies of above sequences will cause changes/rejection, as applicable, to the sequences.								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 27.0 Abort OR NOMENCLATURE AND NO. OF CEI			EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.		DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
27.1 Terminate SRM Thrust	G.	The torque impulse resulting from thrust termination shall be less than TBD in.-lb.-sec. in pitch and yaw and TBD in.-lb.-sec. roll when measured about the motor center of gravity at thrust termination.		SRM T.T. System						
	H.	A means is required to enable and disable the Thrust Termination System upon command.		SRM T.T. System S & A Device						
	I.	Design of the Thrust Termination System shall be in accordance with the safety requirements of the OMSF Safety Program Directive No. 1A, "System Safety Requirements for Manned Space Flight", December 1969.								

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
27.1 Terminate SRM Thrust	A. The SRM thrust shall be terminated upon receipt of a signal of 28+3 vdc, 9^{+2}_{-0} amps for 2 to 5 seconds, at the SRM/Space Shuttle interface.		SRM						
	B. The thrust terminate signal shall be transmitted within the SRM to the thrust termination system.		SRM Cabling						
	C. The simultaneity of thrust termination between SRM's shall not exceed ______ milliseconds.		SRM T.T. System						
	D. After receipt of termination command, the maximum mean positive (forward) impluse from the motor shall be less than TBD lb-sec. The variation (3 sigma) in positive impulse after receipt of command shall be less than ± TBD lb-sec. at any thrust level. At no time after zero thrust is attained shall the net thrust from the motor become positive.								
	E. The thrust termination system shall not cause damage to the Space Shuttle or in any way affect the future performance of the Shuttle.		SRM T.T. System						
	F. The SRM shall be capable of thrust neutralization at any time during SRM burn.		SRM T.T. System						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 27.0 Abort OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
27.2 Destruct SRM's Due To Inadvertent Separation	Each SRM shall contain an Inadvertent Separation Destruct System (ISDS). The ISDS is to accomplish SRM destruct by inadvertent separation of one or both SRM's from the Space Shuttle vehicle, or by inadvertent separation of Space Shuttle Vehicle components. .		SRM ISDS						
	The ISDS shall destruct all portions of the SRM to prevent possible impact in a critical area.								
	A. Upon detecting an inadvertent breakup or separation of either SRM, circuitry shall automatically initiate a destruct signal to the separated SRM.		SRM Cabling						
	B. SRM internal power shall be provided to supply the bias power for the senesing circuitry.		SRM ISDS Battery						
	C. SRM internal power shall be provided to power the destruct ordinance for the ISDS.		SRM ISDS Battery						
	D. The ISDS system shall use the same destruct ordinance as the command destruct system.		SRM Destruct System						
	E. Design of the ISDS system shall be in accordance with the safety requirements of the OMSF Safety Program Directive No. 1A, "System Safety Requirements for Manned Space Flight", December 1969.		SRM Destruct System						

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FUNCTIONAL DIAGRAM TITLE AND NO. 27.0 Abort OR

NOMENCLATURE AND NO. OF CEI

FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	EQUIPMENT IDENTIFICATION: NOMENCLATURE	EQUIPMENT IDENTIFICATION: CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS: TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
27.3 Command Destruct SRM's	Each SRM shall contain a command destruct system. The system is to accomplish SRM destruct by command to prevent the Space Shuttle System predicted impact point from coinciding with a "critical area."								
	A. The command destruct system shall be initiated upon receipt of command signal of 28 + 3 vdc, 9 $\pm^{2}_{0}$ amps for 250 to 750 milliseconds at the SRM/Space Shuttle interface.		SRM Destruct System						
	B. The command signal shall be transmitted from the SRM/Space Shuttle interface to the destruct system.		SRM Cabling						
	C. The power to activate the command destruct system ordinance will be provided by the power supply in the Space Shuttle.		Space Shuttle						
	D. The command destruct system shall use the same ordinance as the ISDS.		SRM Destruct System						
	E. Design of the command destruct system shall be in accordance with the safety requirements of the OMSF Safety Program Directive No. 1A, "System Safety Requirements for Manned Space Flight", December 1969								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 27.0 OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
27.4 Restrain Space Shuttle System on Launch Pad	A requirement exists to restrain the Space Shuttle System on the launch pad for a period of time of 135 ± TBD sec, after ignition of the SRM'S. Only those functions to be performed by the SRM will be considered here.								
	A. The SRM's must interface with the launch hold down equipment as defined by ICD ______________.		SRM aft skirt extension						
	B. The SRM's must provide the structual capability to restrain the Space Shuttle System while a delta thrust force of _________ pounds force is being applied.		SRM aft skirt extension						
	C. The interface between the SRM's and the launch hold down equipment shall be such that release of the Space Shuttle System for flight can occur anytime during the period described above.								

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28.0 Assemble and Checkout SRM Segment Subassemblies	A requirement exists to subassemble and checkout the SRM segments at the RISS Building at KSC. The subassemblies will consist of: 1. Aft segment subassembly consisting of: a. Aft segment with nozzle and HPU. b. Destruct ordnance 2. Center segment subassembly consisting of: a. Center segment b. Destruct ordnance 3. Forward segment subassembly consisting of: a. Forward segment b. Destruct ordnance								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 28.0 Subassemble and Checkout SRM Segments OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
28.1 Assemble Aft Segment Subassembly	A requirement exists to assemble the aft segment subassembly prior to checkout.				28.1 Assemble aft segment subassembly.				Operations Manual
	A. A means shall be provided to support the aft segment during assembly operations.		Chocks		28.1.1 Assemble destruct ordnance.	2.0	3 men		
	B. A means is required to handle the following items during assembly:	Overhead Crane	Lifting Sling						
	1. Destruct ordnance								
	C. Access shall be provided at the assembly points.		Work Platform						

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FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
28.2 Checkout Aft Segment Subassembly	A requirement exists to checkout the aft segment subassembly prior to transport to the VAB for SRM buildup.				28.2 Checkout aft segment aft segment assembly.				Operations Manual
	A. Checkout the HPU for end-to-end continuity of electrical system and other HPU discretes (TBD).		HPU/Nozzle Test Set		28.2.1 Checkout NPU.	1.5	2 men		
	B. Access shall be provided to the HPU for checkout		Work Platform						

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 28.0 Subassemble and Checkout SRM Segments OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				PROCEDURAL DATA REQUIREMENTS
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	
28.3 Assemble Forward Segment Subassembly	A requirement exists to assemble the forward segment subassembly prior to transportation to the VAB for SRM buildup.				28.3 Assemble forward segment subassembly.		x		Operations Manual
					28.3.1 Install destruct ordnance.	2.0	3 men		
	A. A means shall be provided to support the forward segment during assembly operations.		Chocks						
	B. Access shall be provided at the assembly points.		Work Platform						
	C. Means shall be provided to handle the following components during assembly:	Overhead Crane	Lifting Slings						
	1. Destruct ordnance								

REQUIREMENTS ALLOCATION SHEET	FUNCTIONAL DIAGRAM TITLE AND NO. 28.0 Subassembly and Checkout SRM Segments OR NOMENCLATURE AND NO. OF CEI		EQUIPMENT IDENTIFICATION		PERSONNEL AND TRAINING EQUIPMENT REQUIREMENTS				
FUNCTION NAME AND NO.	DESIGN REQUIREMENTS	FACILITY REQUIREMENTS	NOMENCLATURE	CEI OR DETAIL SPEC OR INDEX OR MASTER CONTROL NO.	TASKS	TIME REQ	PERFORMANCE REQUIREMENTS	TRAINING AND TRAINING EQUIP. REQ	PROCEDURAL DATA REQUIREMENTS
28.4 Assemble Center Segment Subassembly	A requirement exists to assemble the center segment subassembly prior to transport to VAB for SRM buildup.				28.4 Assemble center segment subassembly.				Operations Instructions
	A. A means shall be provided to support the center segment during assembly operations.		Chocks		28.4.1 Assemble destruct ordnance.	2.0	3 men		
	B. A means is required to handle the following items during assembly:	Overhead Crane	Lifting Slings						
	1. Destruct ordnance								
	C. Access shall be provided at the assembly points.		Work Platform						

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